THE IRON AGE

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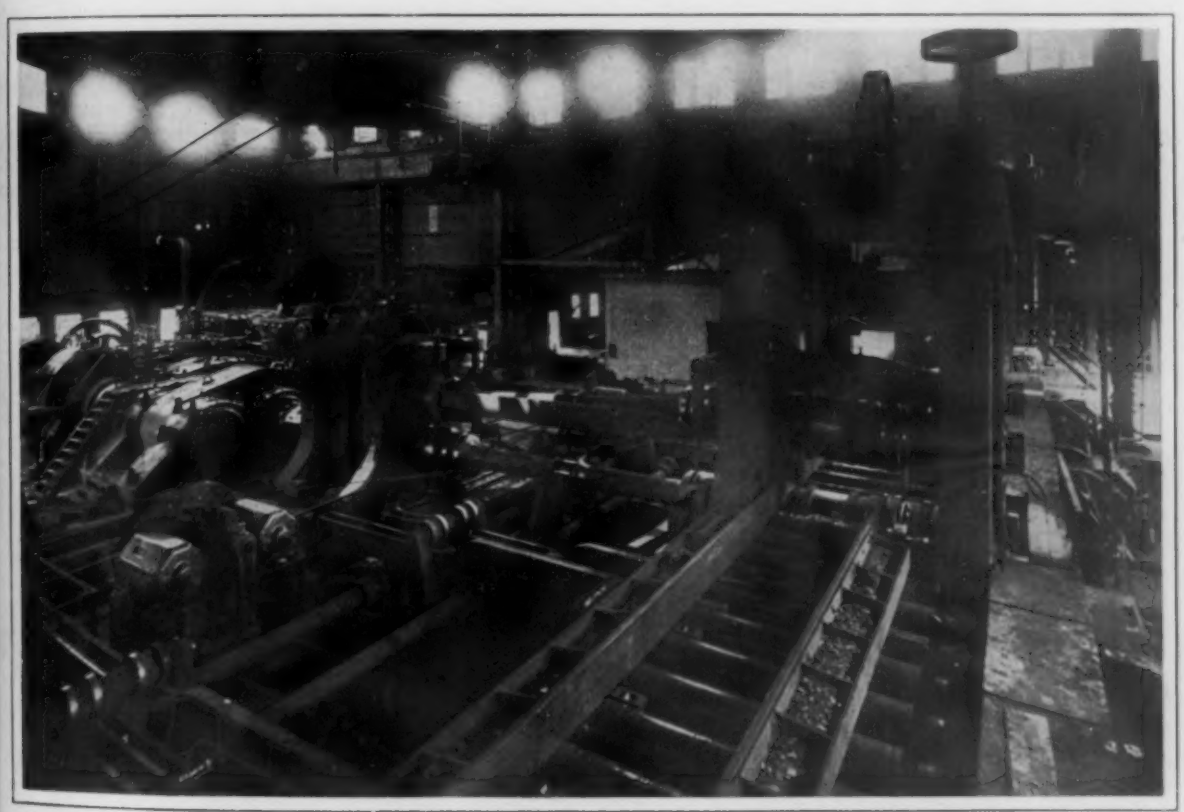
Pennsylvania's Rail and Structural Mill

Combination Mill Rolling Tee and Girder Rails and Beams Up to 24-in., Channels Up to 18-in. and Angles Up to 8 x 8-in.

(With Supplement)

The Pennsylvania Steel Company has put in operation at Steelton, Pa., a combination structural and rail mill which will not only produce girder as well as tee rails, but I-beams up to 24-in., channels up to 8-in. and angles as large as 8 x 8 x 1⅛ in. The structural mill, it is expected, will have a capacity of 1000 tons per day of 24 hr., while the capacity of the blooming mill is still greater, so that the new mill will be capable of supplying billets for use elsewhere in the works and for sale. In rails there are facilities for rolling girder rails 140 ft. long.



The Compound Reversing Mill Engine, at Left Background, Is Controlled from Pulpit Spanning the Blooming Mill Approach, and the Ingot Manipulators Are at Left Foreground, While a Large Brick Enclosure for the Electrical Control Apparatus Is in Center Background

Besides the fact that this mill represents considerably increased rolling-mill capacity in the East in structural shapes and rails, the mill is of more than usual interest in respect to design and equipment. Some of the rolls and rolling-mill engines and other equipment were originally installed in the plant built on Staten Island, New York, for Milliken Brothers, but a new blooming mill, some new cranes, some new mill drives and other equipment and a remodeling of the remainder were necessary. Including rebuilt pit heating furnaces for soaking the ingots and the reheating furnaces for the blooms, the plant has every aspect in both arrangement and apparatus of an entirely new development. It is interesting that the old open-hearth furnace building at Steelton was utilized for housing the rolling mill proper with considerable additions at both ends, which makes the combined structural and rail mill 1400 ft. from end to end.

A general plan of the plant is given in an accompanying supplement. After stripping, the ingots are run into the pit furnace building on ingot

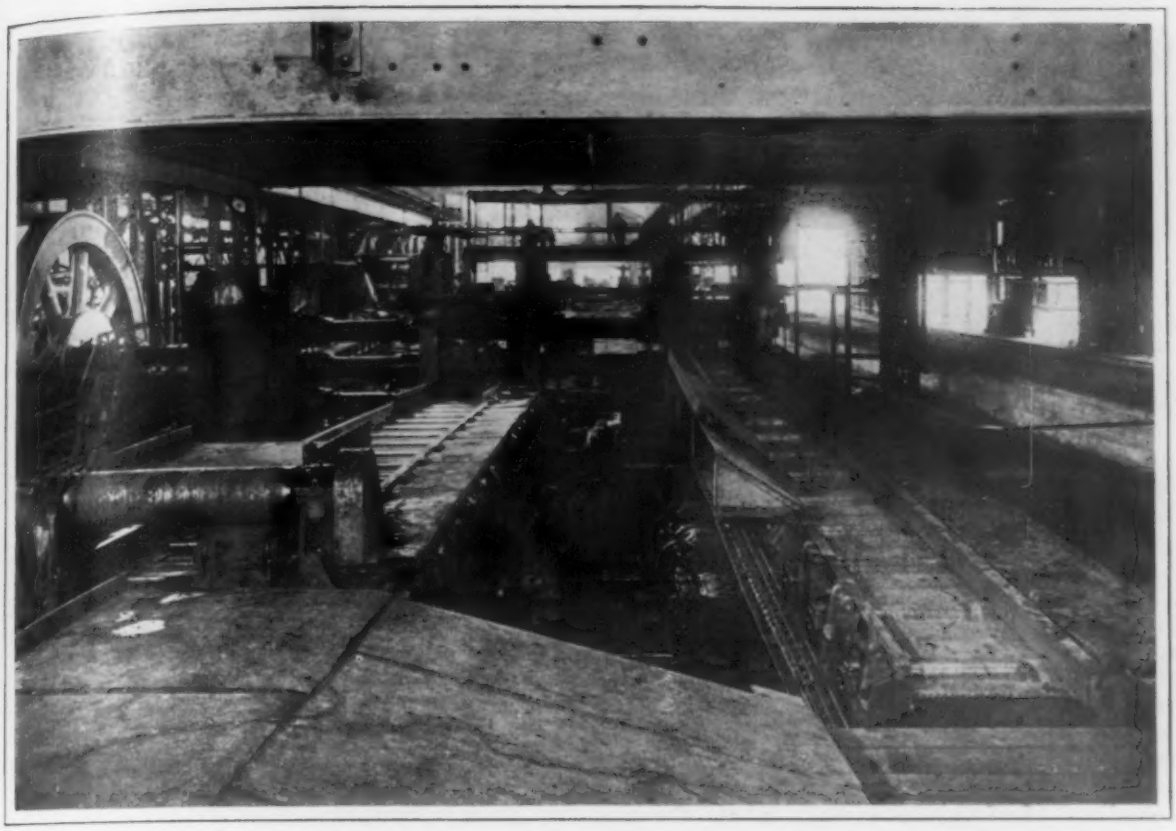
Ingots Are Brought into the Pit Furnace Building on the Track at the Right and the Chariot Shown Carries the Heated Ingot to the Mill Approach Table

cars and two overhead traveling cranes place them in the pits. There are four pit furnaces, of four holes each, with a capacity of four ingots per hole or 16 per furnace, 64 for all four furnaces. Each hole is 7 x 8½ ft. in size and the capacity stated is based on ingots as large as 25 x 30 in. and 7 ft. high. As each of these ingots weighs about 7½ tons, the capacity of the soaking pits with a blooming-mill capacity of 60 tons an hour is such that under the full scale of operations each ingot could remain 8 hr. in the soaking pit. The furnaces use producer gas generated in a nearby group of producers, the gas intakes shown on general plan.

Parallel to the ingot track is the chariot track, 10 in. above the ingot track, this receiving of course the heated ingots from the pits and dumping the ingot on the approach table to the blooming mill. The pit furnaces and these two tracks are served by two cranes which have a span of 71 ft. 9 in. The pit furnaces are not sunk in the ground, owing to the watered condition of the site, due partly to the proximity of the Susquehanna River, and the arrangement allows for the ready removal of the slag and scale from the pits.

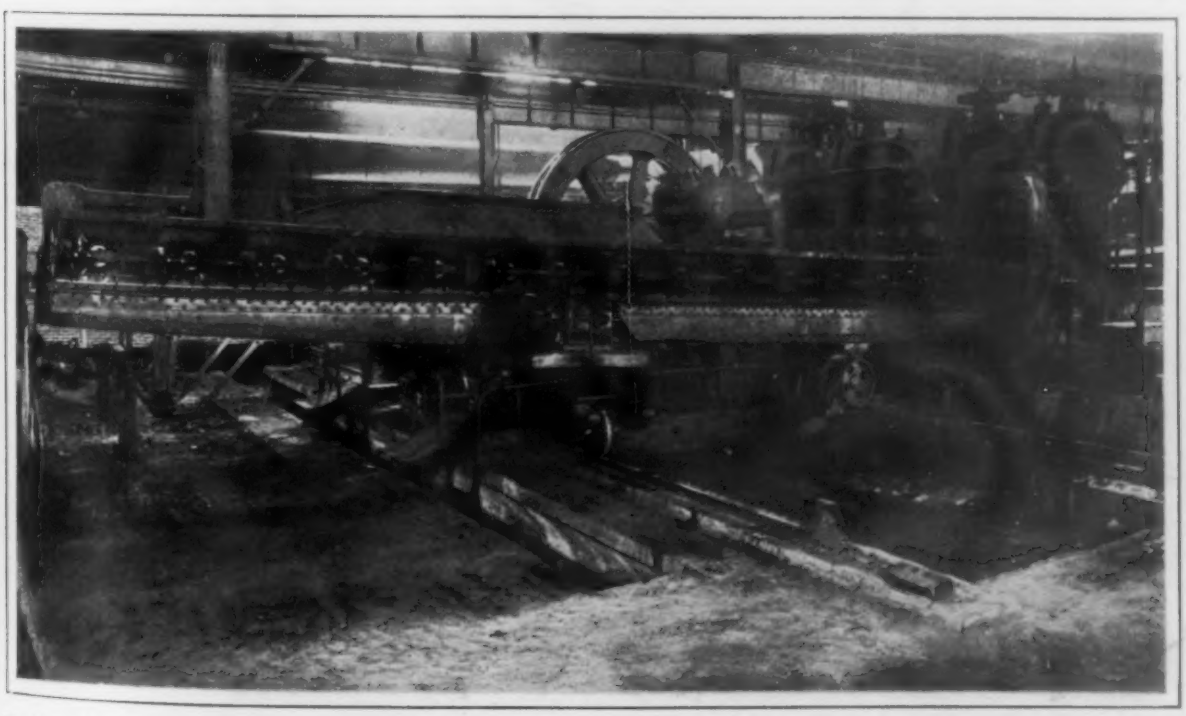
The mill includes a 44-in. two-high blooming mill, which was built by the Mesta Machine Com-

Blooms Reach the Reheating Furnace Building on Rollers in Foreground and the Transfer Buggy Takes Them Singly to the Furnace Charger

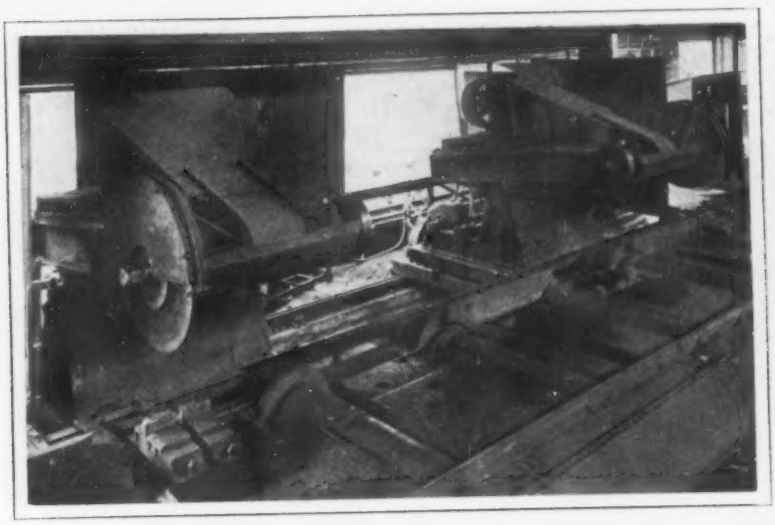


The Two Traveling Tilting Tables on One Side of the Two 28-in. Intermediate Stands, Looking Under One Operating Pulpit Toward the Finishing End of the Mill to Other Pulpit

pany; a 35-in. roughing train which takes the blooms; a 28-in. intermediate train comprising two stands each three rolls high, the two stands located side by side, with transfer tilting tables for serving them, and a 28-in. two-high finishing stand. The blooming mill is operated by gear connection to a 36 and 60 x 54-in. reversing engine built by the Southwark Foundry & Machine Company and this and the rolls and the table manipulators are all operated from a pulpit spanning the approach table. Except for the engine drive all other operations of the blooming mill are electrical and in this connection a separate brick building within the blooming-mill structure has been provided to house the solenoid motor control apparatus. Among the motors are four 75-hp. units connected in pairs to the 9-in. shafts to actuate rack form of manipulators for turning over the ingot on the blooming-mill tables. There are also two pairs of 50-hp. Crocker-Wheeler motors for the screw downs of the rolls. The blooming-mill engine is operated condensing with a Weiss jet condenser, which serves also the 28-in. intermediate train engine, and the apparatus includes a Southwark steam actuated air pump and



The Under Construction of One of the Traveling Tilting Tables and the Rails in the Pit on Which It Moves To and Fro Across the Stands



The Hot Saws on the Runout to Hot Beds

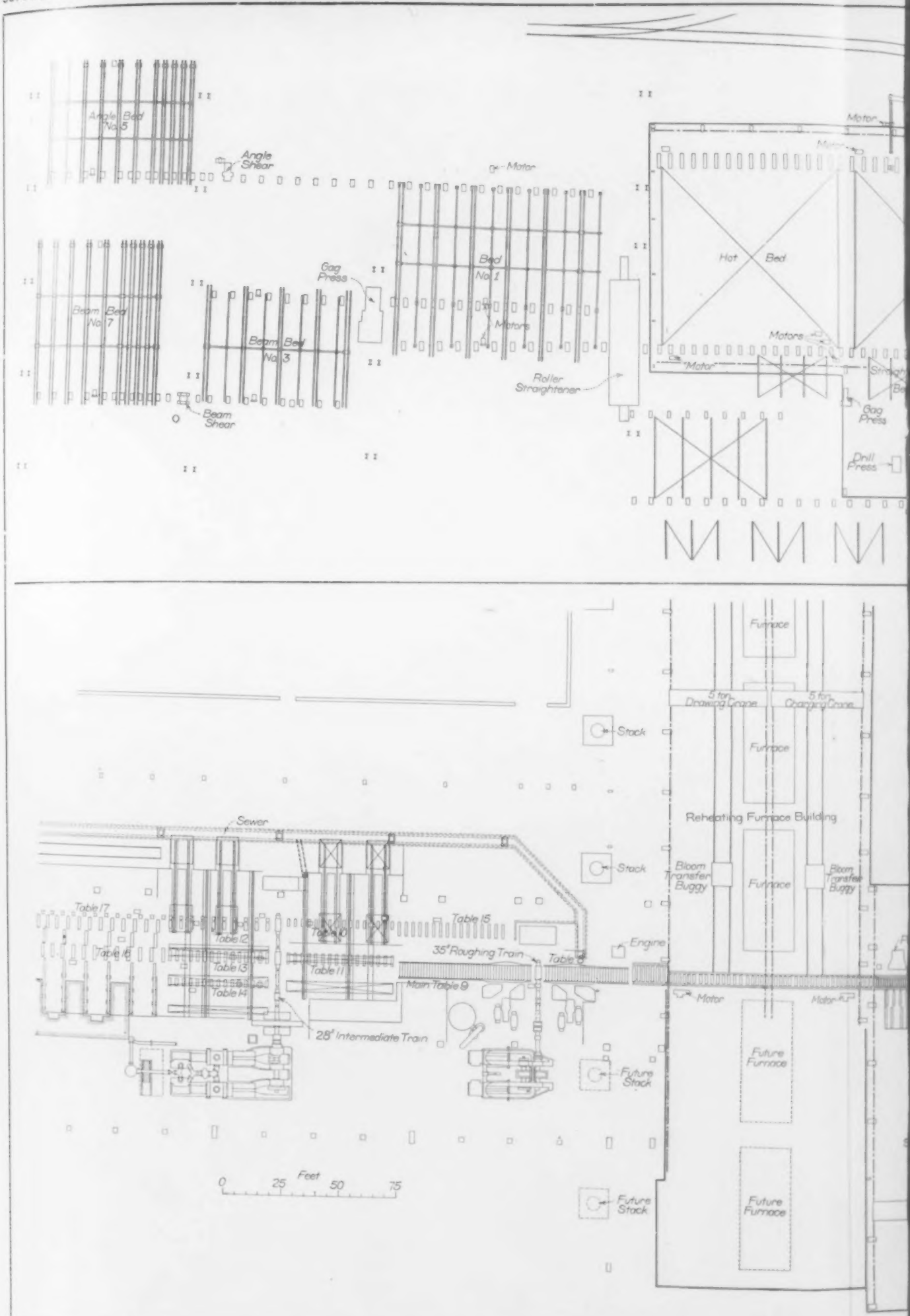
a circulating pump driven by 250-hp. 2200-volt three-phase Allis-Chalmers motor. The blooming-mill building is commanded by a Morgan crane of 80 tons capacity and of the same span as, and traveling parallel with, the cranes over the pit furnaces. Sufficient space is available in the building for handling and storing repair parts.

Immediately beyond the blooming mill, the roll tables lead to the shear building where the crop ends are removed and where billets may be delivered for carriage to other parts of the steel works or to railroad cars for distant shipment. The shear is a 1000-ton William Tod steam hydraulic shear. The building is also spanned by a 25-ton Morgan crane, which is also of 71-ft. 9-in. span and travels parallel to the blooming mill and pit furnace cranes. This crane is used also for repair work and considerable storage space for billets is provided in the building.

The blooms for further rolling in the structural mill, to be turned into rails or shapes, continue from the shear building to the reheating furnace building. Here there are three furnaces in a line perpendicular to the direction of the roll tables and space for two more such furnaces, as indicated in the general plan. A bloom transfer buggy, traveling on rails in the reheating furnace building, is spotted on the roller table to receive the bloom and then is hauled by an endless cable, motor driven, to the desired point at any furnace. Traveling above it is a 5-ton Wellman-Seaver-Morgan charging crane which takes the bloom and places it in the furnace. A similar arrangement is provided on the discharging side of the furnaces, comprising a 5-ton drawing crane of the same design as the charging crane, which crane deposits the heated bloom on a transfer buggy, which, similarly operated by a cable, carries the bloom to the roll tables whence the bloom is taken to the 35-in. and 28-in. mills.

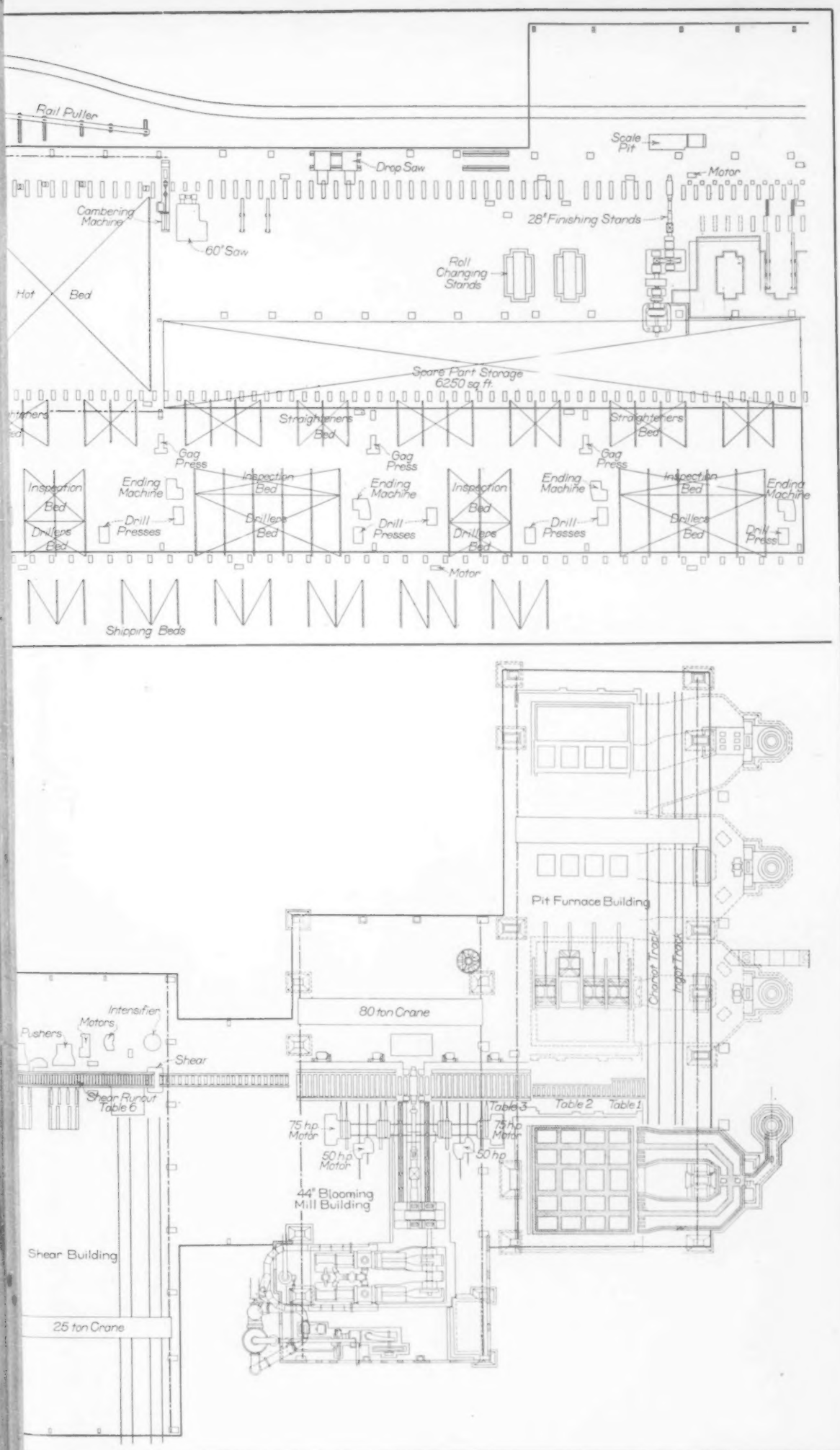
Each furnace has eight doors. The furnaces will accommodate blooms of 10,000 lb. each and the present equipment of furnaces with two blooms per furnace opening provides reheating space for 240 tons. With the finishing mills operating at the rate of 1000 tons per day, it will be seen that furnace capacity is sufficient to provide for 6 hr. heating

The Hot Beds; Rail Finishing Department at Left and the Beam and Angle Yard at Right Background



Combination Rail and Structural Mill, Pennsyl

From Right to Left, the Lower Cut Covers the Mill from the Pit Furnaces Through the 28-in. Intermediate Roll
Distances Are: Blooming Mill to Bloom Shear, 100 ft.; Shear to 35-in. Roughing Train, 215 ft.; Roughing Train
Finishing Stand to Cambering Ma



lvania Steel Company, Steelton, Pa.

l Trains, and the Upper Cut Is a Continuation of This Plan. Some of the Center to Center n to 28-in. Intermediate Train, 113 ft.; Intermediate Train to 28-in. Finishing Stand, 162½ ft.; achine, 201 ft.

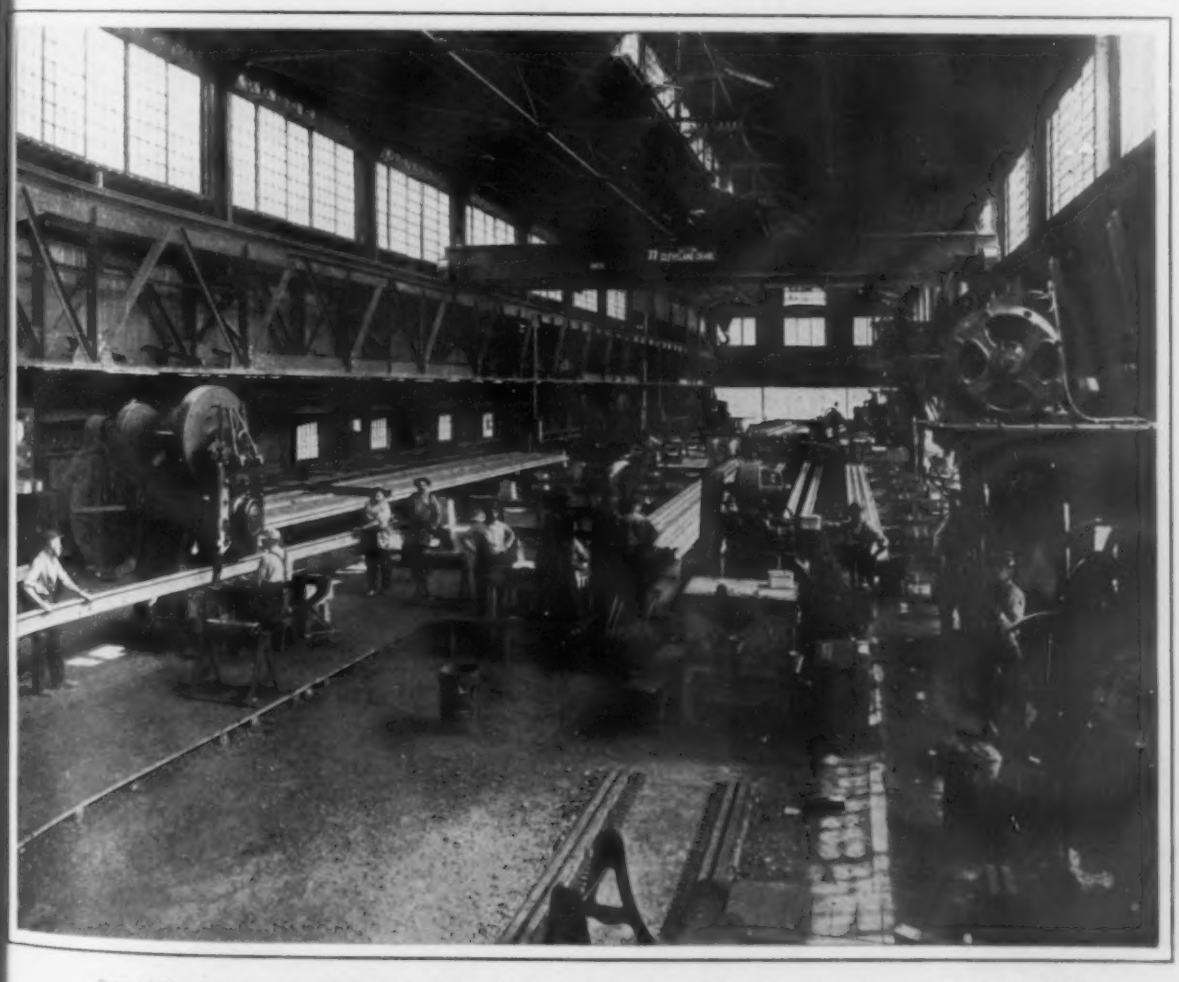
each bloom. The charging and drawing cranes are each of 41-ft. span, and an interesting detail is that immediately behind the crane operator when he is opposite a furnace door is an air valve by means of which the crane operator can conveniently open and close each door as necessary. The air valves for opening the furnace doors were supplied by the Rutan Valve & Machinery Company, Elmira, N. Y.

Beyond the reheating furnace one enters the space formerly occupied by the old open-hearth steel plant. The 35-in. roughing train is a two-high mill operated by means of a twin simple 40 x 48-in. reversing engine, which can be run condensing or instead can deliver the exhaust for utilization in a mix flow turbine. This is one of the interesting features of the plant. No exhaust steam regenerator is used, but instead what is merely a steam storage chamber is employed and to this is brought also the exhaust from air compressors and some of the steam pump auxiliaries. The turbine is a General Electric horizontal type and drives a 2300-volt alternating-current generator used mainly for various motor drives; while rated at 2500 kw., it delivers 3500 kw. as commonly operated. There is an independent condenser for the mixed flow turbine unit.

The 28-in. intermediate train, which is a substantially new mill, comprises two stands, as stated, with transfer tilting tables on both sides of the mills; the mills are three high, requiring the tilting feature, and the traveling feature puts the bloom through the proper roll grooves or takes the product from one stand to the other. Four tables are required for the simultaneous operation of the two stands. There are four tables of the usual transfer tilting type used in rolling structural material. A fifth table of special design replaces one of the structural tables when rails are rolled. This table is of the traveling type and contains one set of tilting rollers and a set of rollers for the bottom pass only. This permits rolling two bars at a time in the intermediate stand.

The pulpit for operating the rolls spans the approach table from the roughing stand and from this point and a similarly located pulpit on the other side of the mills are controlled the tilting of the

Roll Shop, Roll Storage in Background



One of the Gag Presses at Left, Rail Finishing Department, and Shipping Department Outside at Right

tables and their movement across both stands. The operator is thus not subjected to the vibrations of the to-and-fro traveling as he is where he travels with the table.

The tables and the rolls are located in a commodious concrete lined pit, well lighted and making various parts readily accessible. Immediately beyond is a space for changing rolls or what is known as the roll changing floor. Here and in one or two other places in the structural mill are spaces for spare housings in which rolls may be assembled for some section next to be rolled and the whole housing transported to the working position with minimum loss of time by means of the overhead traveling crane.

The engine, a Southwark twin compound unit of 36 and 60-in. cylinders and 54 in. stroke, is equipped with a flywheel; with the three high mills, cotinuous operation in the one direction at a substantially constant speed of 90 r.p.m., is desirable. As already mentioned the engine is operated condensed in connection with the blooming-mill engine. One of the old open-hearth furnace cranes, having a span of about 62 ft., also serves this part of the plant.

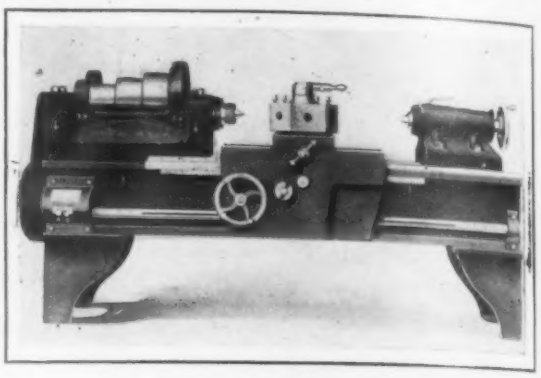
A 28-in. finishing stand for the final pass of the structural shape or rail, as the case may be, is electrically driven, by a General Electric 1200-hp. 2200-volt 25-cycle motor, housed in a small brick structure, which protects the motor and control apparatus from the dust more or less likely to be precent in the mill atmosphere. The rolls are mounted in a housing built by the United Engineering & Foundry Company. The plan shows the run out from the finishing mill, the location of roll changing stands, the location of the rail-cutting saws, and the rail puller for aligning the cambered rails on the hot bed. Space is also available for quenching tanks in the event that heat treating of rails, which is now being discussed, becomes a feature in rail manufacture.

The hot beds, of which there are two, of large size, and the arrangement of the beam and angle beds and the rail shipping department are shown in the plan. There is one 100-ft. span, 10-ton Cleveland crane commanding the hot beds and from this is controlled the mechanical movement of the material across the beds to the roller table delivering to the beam yard or to the rail straightener beds of the rail finishing department. The convenient arrangement of the gag presses to the different straightener beds and of the inspection beds, with the adjacent end milling machines and the multiple drill presses for drilling the holes for joint bolts and bands and finally the different shipping beds with roller conveyance to them are indicated in the plan. The rail shipping beds are spanned by a 75-ft. crane and immediately beyond the shipping beds, not covered by the plan, are the railroad tracks for the cars to receive the rails for shipment. The multiple drill presses were built by the Bausch Machine Tool Company, Springfield, Mass., and an Alliance magnetic crane is used for loading the rails.

In connection with the new mill the company has erected a commodious roll shop and roll storage. This shop includes United Engineering & Foundry lathes, Detrick & Harvey planing machines and Dreses radial drilling machines. It has a wood block floor, notably large window area and a lofty roof, timber covered. The rolls are stored in sets of two, one set vertically above the other, with old rails set vertically in a concrete foundation to hold the rolls in place. They are thus convenient of access.

Engine Lathe for Single Purpose Work

A heavy duty engine lathe intended for the kind of work represented in shrapnel shells and designed for practically single purpose duty is being marketed by the McCoy-Brandt Machinery Company, House



McCoy-Brandt Engine Lathe

Building, Pittsburgh. Its general features are indicated in the accompanying illustration. It is made with an 18-in. x 8-ft. bed, has a carriage with long bearings on the bed with a V groove having a large surface for wear, and a tailstock of comparatively high strength and rigidity. The lathe has a three-step cone, is driven by a 5-in. belt and is back geared. There are six changes of speed, three being secured by the pin at the head of the lathe in combination with two positions of the lever at *A* and *B*. The carriage is designed to receive a six tool turret, if desired, or a compound rest may be supplied.

United Steel and United Furnace Contracts

A number of contracts in connection with the new blast furnace of the United Furnace Company and extensions to the plant of the United Steel Company, Canton, Ohio, have been let in the past few days. Contracts for steel work in connection with the blast furnace have been divided between the Massillon Bridge & Structural Company and the Canton Bridge Company. The contract for the plate work had previously been placed with Variety Iron & Steel Works Company, Cleveland. The contract for the boilers went to the Babcock & Wilcox Company. The contract for the steel building for the new plant of the United Steel Company has been placed with the Fort Pitt Bridge Company, Pittsburgh. The S. R. Smythe Company, Pittsburgh, has the contract for the open-hearth furnaces, and the Morgan Construction Company, Worcester, Mass., the contract for the sheet-bar mill. The building for an addition to the present plant has been placed with the Canton Bridge Company. A Lamberton mill will be installed in this plant by Mackintosh, Hemphill & Co., Pittsburgh. The Westinghouse Electric & Mfg. Company will furnish the electrical equipment. The new plant will occupy a building 85 x 780 ft. The company will also erect a building for a shipping room 160 x 400 ft.

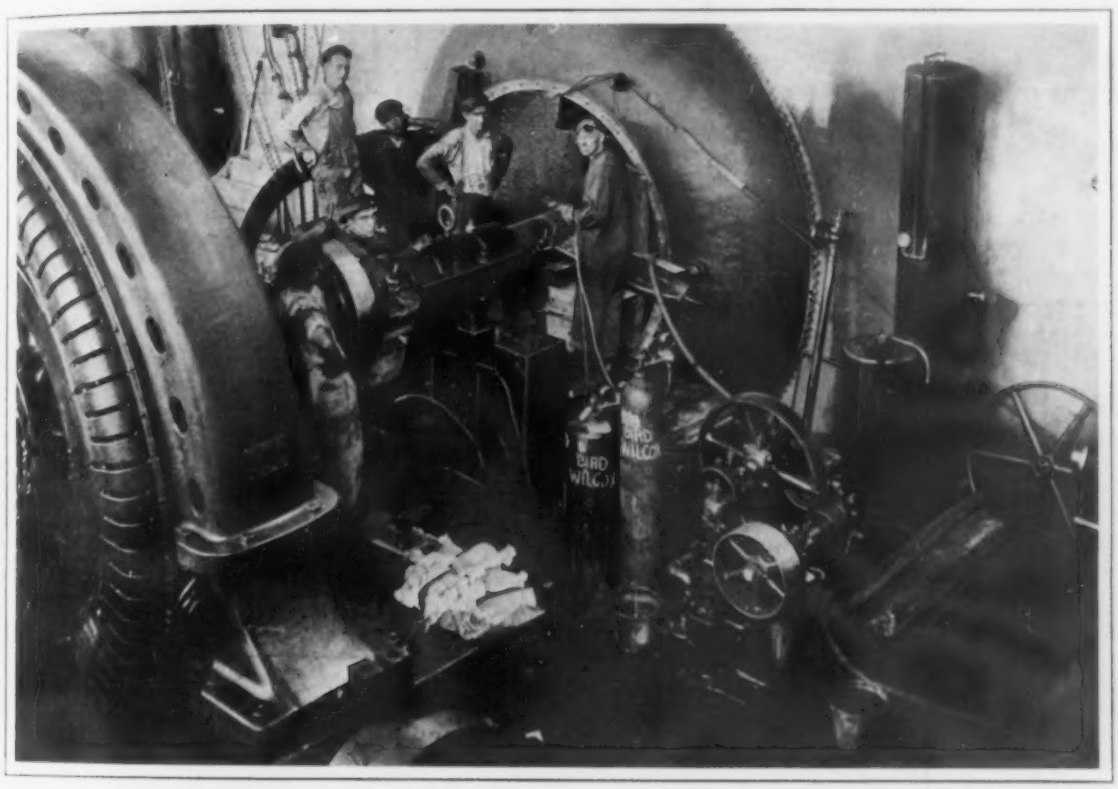
The Purchasing Agents' Association of New York will hold its next meeting at the Hotel Breslin, Tuesday evening, Sept. 21. H. B. Twyford, author of "Purchasing," will make an address, and the National Tube Company, Pittsburgh, will present three reels of motion pictures in colors showing the various processes in the manufacture of steel pipe. C. F. Roland of the company's metallurgical department, will explain the films.

The Chicago Steel Foundry, Chicago, of which David Evans is president, has purchased adjoining property to permit a further extension of its plant. In the three years since its present foundry was placed in operation the operating capacity has been increased 200 per cent and the ground area owned by the company 50 per cent, an expansion made necessary by actual growth in business.

METAL ADDED TO A SHAFT

Worn Shaft Built Up in Place by Oxy-Acetylene Welding

A special case of economical repair by welding was recently completed by the Bird-Wilcox Company, Atlanta, Ga., which built up to its original diameter a 10-in. generator shaft that had been worn down 3/8-in. by the abrasive action of the metal in a stuffing box. The generator is one of seven units of 2000 kw. capacity in the power station of the Georgia Railway & Power Company at Bull Sluice, Ga., which supplies power for the city of Atlanta. The shaft which is about 29 ft. long carried two water wheels at one end. The stuffing box was about midway of the shaft and served to keep the water from entering the power house.



Building Up a 10-In. Generator Shaft, Which Was Slightly Worn Away, by Oxy-Acetylene Welding without Removing Shaft from Bearings

Ten years of constant use had worn down the shaft until it became seriously weakened. The repair by welding was done, it is figured, at one-twentieth of the cost of replacement of the shaft.

The problem was to do the work without straining and bending the shaft during the preheating and welding. It was preheated by means of a large kerosene preheater and the welding was started. A special low-carbon steel filler was used and the shaft was built up to a thickness of 3/4-in. for 9-in. along the reduced section. As the work progressed the weld was hammered to increase the density of the metal, and when the work was completed an excess of 1/4-in. was obtained over the original diameter of the shaft. Upon cooling it was found that the shaft was sprung about 1/16-in. at the center and 1/4-in. at the ends. By careful manipulation this warp was reduced to 0.001-in.

The shaft was turned down in its own journals, as indicated in the illustration. A cutter head used for turning off commutators at the power plant was employed. It was bolted to the water caisson, the frame held rigid by bolts and blocks, and it was fed by hand. The cutter head was stationary and the shaft was revolved by changing the commutator brushes in such a way that the generator was transformed into a motor driven by one of the other units.

Department of Chemical Engineering at Columbia University

Courses leading to the degree of chemical engineer have been offered in the department of chemistry of Columbia University, New York, for the past ten years, but, in recognition of the rapidly increasing importance of industries based upon the applications of chemistry, the trustees of the university have established a separate department of chemical engineering. The head of the new department will be Prof. M. C. Whitaker, who has been professor of chemical engineering at Columbia University for the past five years.

Royersford Company Making an Upright Drill

An upright power drill is to be put on the market by the Royersford Foundry & Machine Company, Royersford, Pa. It is of the type in which various speeds are obtained by cone pulleys and which has a table which may be raised and lowered on the column of the machine. It is a 20-in. machine with capacity of drilling up to 1½ in. in diameter. The table is 18 in. in diameter with a traverse of 21½ in. on the column of the machine. The spindle has a traverse of 9 in. The machine occupies a floor space of 23 x 50 in. and 1 hp. is required to drive it.

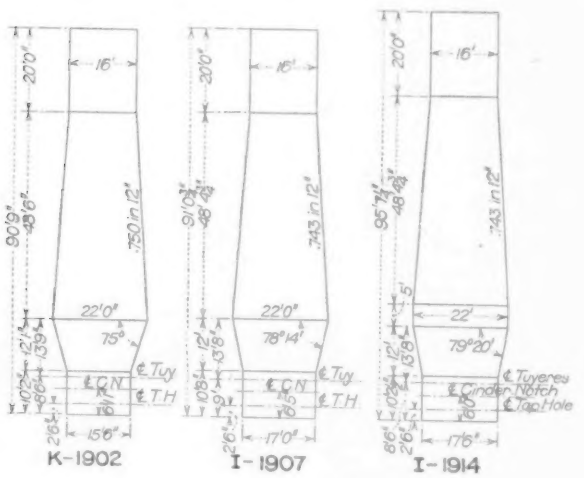
The Tropenas Converter Company has moved to its new laboratory. While a New York office will be preserved at 50 Church Street, all business of an executive nature will be transacted from Brooklyn, at 2243 Nostrand Avenue.

The Trend of Blast Furnace Improvements

Extensive Tests of a Blast Furnace and a Hot Stove—What Improvements in Equipment and Operation May Be Expected

At the meeting in May this year of the American Iron and Steel Institute A. E. Maccoun, superintendent of the Edgar Thomson furnaces of the Carnegie Steel Company at Pittsburgh, presented an exceedingly elaborate paper on "Blast Furnace Advancement," which has not up to this time been reviewed at length in these columns. Besides taking up in some detail the improvements made in the methods of producing pig iron, some emphasis was given to the probable lines of the future developments in blast furnace design and operation.

Mr. Maccoun holds that the production of iron in the blast furnace is the most efficient of all the metallurgical processes in the utilization of heat,



Late Development in Lines of Edgar Thomson Blast Furnaces

and still we may, he believes, look for a further increase in this efficiency. This increased efficiency is to come in the maximum utilization of the energy contained in the blast furnace gases, but there will be greater efficiency through new labor-saving machinery and through devices for obtaining more regular operation, such as distribution, greater uniformity of material and of the blast—factors which will not only help to increase and improve the products, but will also decrease the cost of production.

COKE NEEDS SCREENING AT OVENS AND FURNACES

On the subject of coke he had the following to say:

A great proportion of our blast furnace trouble comes from the use of dirty coke or coke of poor quality. The former condition is always due to carelessness in its manufacture; too much stress cannot be given to this point. Coke should be thoroughly screened at the ovens as well as at the furnace bins. It is foolish to expect to get fuel value out of coke breeze and the small dirty screenings which accompany poorly prepared coke.

Coke dust contains a large proportion of the ash, sulphur, phosphorus and other impurities contained in the coke, and on account of its fineness and its tendency to cause a furnace to scaffold adds additional irregularities to furnace operations. As the amount of dust received with shipments of coke is not constant, but varies greatly at times, it is impossible properly to burden the furnace to offset the effects of this objectionable material.

Some analyses of coke dust are given below. From these results it can be seen that this material is very bad and utterly unsuited to obtain uniformity in blast furnace practice.

Analysis of Dry Coke Dust

Fixed Carbon, Per Cent	Volatile Matter, Per Cent	Ash, Per Cent	Sulphur, Per Cent
68.60	3.00	28.40	0.961
71.40	3.20	25.40	1.125
71.15	3.25	25.60	1.250

It must also be borne in mind that the ash requires one and one-half times its weight of stone, and the sulphur over three times its weight of stone to neutralize or flux it, irrespective of the total amount of sulphur to be taken up by the slag. It must also be borne in mind that the weight of slag produced requires 25 per cent of its weight of carbon to melt it.

The best bee-hive coke suitable for blast furnace use is distinguished by hardness, the power of resisting a crushing load, and an almost metallic luster, together with freedom from slate enclosures, which raise the ash content; while the worst is the soft, dark colored and pulverulent variety known as "black ends."

THE VALUE OF BY-PRODUCT COKE

By-product coke, as now manufactured at our modern plants, is superior to the Connellsville coke for blast furnace use, on account of its uniformity in size, weight and analysis. In addition the valuable by-products are recovered, such as coke oven gas, tar, ammonium sulphate and benzol. Slow burning of by-product coke has been remedied by the use of higher blast temperatures, by using perfectly screened coke, by breaking it smaller and by regulating its manufacture in many other ways to secure the proper combustibility.

Progress is being made in washing coal to lower the sulphur content, while promising results have also been obtained from pneumatic separators. There will be further development along these lines in the future, as the advantages of using coke low in sulphur and ash in a blast furnace are now fully appreciated.

BEST CONDITION OF THE LIMESTONE FLUX

As regards the limestone used as a flux, he advises that a stone should not be used which contains fines that can be removed by a 1-in. square screen and the stones should be fairly uniform in size, passing through a 6-in. screen. He emphasizes the desirability of screening the stone so that it may not contain any clayey material. Each decrease of 1 per cent silica in the stone between 5 per cent and 1 per cent amounts to a reduction in cost of approximately 10c. per ton of limestone.

From his observations on the blast furnace and its accessories the following notes are taken:

FURNACE SHELLS AND EQUIPMENT

Furnace stacks having a lining of moderate thickness, approximately 36 in., are preferred. The thin-lined stack has not been, on the whole, as successful as was hoped for.

Furnace shells of heavy riveted steel plate construction are being used, and downcomers and dust catchers are being greatly increased in strength. Linings are laid directly against the shell and no packing space is used, as formerly, to take care of the expansion of the brickwork.

Hearth jackets strong enough to resist the expan-

sion of brickwork, made absolutely tight, and thoroughly water cooled, are used; as a result they almost eliminate the danger of severe breakouts. Ditches around hearth jackets have been found objectionable.

The bosh usually preferred for large Mesaba furnaces is protected by bronze cooling plates and heavily banded to supply the necessary strength. An overcooled bosh is very objectionable, as it is often responsible for poor furnace practice. On large Mesaba furnaces the water cooled steel plate bosh with sprays or buckets has not given good results.

Bosh angles have become steeper and shorter, making a quicker descent for the charge. Distances of tuyeres above cinder notch have been increased slightly to advantage. The batter of furnace stacks has been increased, and is now preferably as near 0.8 in. to a foot as possible.

Large bells of from 12 to 13 ft. diameter, with 50 to 55 deg. angle, are preferred on stock lines from 16 to 17 ft. The steeper angle helps to prevent ore accumulating on their surface, which injures the distribution. In some cases we obtain just as good if not better results with a 9½-ft., 50 to 55 deg. angle bell, and an 11½-ft. Killeen distributer.

THE LINES OF THE FURNACE

With regard to the developments of furnace lines, Mr. Maccoun brought up the developments of the Edgar Thomson furnace lines beyond the point reached by H. A. Brassert, in a paper read before the American Iron and Steel Institute in May, 1914, and reviewed at length in THE IRON AGE. From illustrations contributed to Mr. Maccoun's paper the accompanying drawing has been taken covering furnace K in 1902 and furnace I in 1907 and in 1914. Mr. Brassert stopped in his analysis with furnace K. It is to be noted that furnace I, which was started in March, 1907, has a 17-ft. hearth, a 78-deg. and 14-min. bosh angle, a 16-ft. stock line and a 22-ft. bosh. With this furnace, Mr. Maccoun says, it was demonstrated that a steep bosh brought about more uniformity in the descent of the charge to the hearth. It was also demonstrated that the short bosh reduced the tendency to hanging. In December, 1908, Mr. Brassert followed with South Chicago furnace No. 7, with a 17-ft. hearth and a 78-ft. angle.

The cut of the sections of the furnaces shows the new proposed lines for furnace I, with a 17-ft. 6-in. hearth, a 22-ft. bosh, a 79-deg. 20-min. bosh angle, a 16-ft. stock line and a height of 95 ft. A slightly improved coke consumption is expected from the increase of 5 ft. in height.

EIGHT DAYS' TEST OF AN ISABELLA FURNACE

Much of the paper was given over to an elaborate test conducted on Isabella furnace No. 3 of the Carnegie Steel Company, Aug. 5 to 13, 1909. The records cover in tabular detail the burden of the furnace and the products; the chemical results in the iron, cinder, gas, flue dust and scrap produced with the ore, stone and coke used; the gas, air and power measurements, and a theoretical heat balance. The furnace was operated on a dry blast. The total production for the eight days was 3245 tons of iron and 4435.3 lb. of ore were charged per ton of iron produced, and 1927.1 lb. of coke per ton, and 1497.6 lb. of stone per ton; and 202.4 lb. of flue dust were produced per ton of iron. The heat value of the blast furnace gas is put at 80.55 B.t.u. per cubic foot at 62 deg. Fahr. and 30 in. barometric pressure.

To indicate the value of the surplus gas from the blast furnace the following figures have been taken from the paper:

Per ton of iron there was produced 135,338 cu. ft. of gas, measured under standard conditions, and this amount, at 80.55 B.t.u. per cubic foot shows a heat output in the blast furnace gases of 10,901,475 B.t.u. per ton of iron.

Of this the blast from the hot stoves showed a utilization of 1,393,709 B.t.u. At an efficiency of 70 per cent this makes it that the hot stoves took 1,991,010 B.t.u. per ton of iron.

The tests of the gas engines and all of the auxiliaries for running the furnace showed that the indicated horsepower corresponding amounted to 2503 hp. This included not only the blowing engines and various supply and feed pumps, but the ammonia compressor for the dry-air blast, the power required for the furnace-charging skips, the motor for the pig machine, etc. With an engine performance of 12,000 B.t.u. per indicated horsepower, the product of 2503 and 12,000 gives the total B.t.u. per hour required for running the furnace. Multiplying this by 24 gives the number of B.t.u. per day, and as there were on the average 405.62 tons of iron produced per day, dividing by this last figure gives the amount of heat required to run the blowing engines and other apparatus per ton of iron, or 1,777,200 B.t.u.

The total heat therefore represented by that utilized by the stoves and that required to run the furnace is 1,991,010 + 1,777,200 = 3,768,210 B.t.u., leaving as the surplus available in the gas 7,133,265 B.t.u.

With coal running 14,000 B.t.u. per pound, calorific value, this amount of heat corresponds to 509.52 lb. of coal per ton of iron. This surplus heat therefore represents a credit per ton of iron equivalent to about 38c. per ton with coal at $1.50, and proportionately higher credits with higher prices of the coal.

THE VALUE OF THE HOT BLAST

The use of hot blast increases the temperature and efficiency of combustion near the tuyeres of a blast furnace, causes the carbon to be quickly converted into carbon-monoxide, and also localizes the heat of combustion. Discussing the subject further the author says:

> Heat supplied to the furnace by the more complete burning of carbon outside the hearth in the stove allows the amount of coke charged to be greatly decreased, consequently a smaller quantity of blast is required, the upper part of the furnace is cooler, radiation losses are lessened and less sensible heat is carried away in the escaping gases. One of the greatest advantages of hot blast consists also in the intense local heat produced in the hearth, this intensity controlling to a great extent the rate of heat transfer to the descending materials, and the efficiency and speed of the smelting. This matter of local heat intensity is of great interest, as it accounts for savings due to high blast temperatures that could not otherwise be explained on the basis of actual heat units added to the hearth by the preheated blast.
>
> The diminished amount of fuel required by the use of high temperatures yields a smaller quantity of slag from its ash, and requires less limestone for fluxing. A furnace of a given capacity contains more ore, and its production is, therefore, increased.
>
> With some furnaces having bad distribution, badly worn lines, etc., it is found impossible to make use of high temperatures, such as 1200 or 1300 deg. Fahr.
>
> One of the savings due to higher temperature comes from the ability to carry more acid slags. The temperature at the tuyeres is more efficient in the removal of sulphur; also, on account of the lower coke consumption, we have less sulphur to remove. The ability to run more acid is a great benefit to successful blast furnace operation, as basic slags gradually cause lime to collect on the bosh, causing scaffolds and frequent cleaning-offs, all of which cause bad furnace operation. Of course our ability to run on acid slags depends to a certain extent on the sulphur in the burden, and the cinder volume being carried.

In regard to stoves the problem is to get as simple a stove as possible. The tendency is to decrease the size of checker openings, and most of the newer stoves have from 5 to 6 in. checker openings in place of the customary 9-in. openings.

A modern blast furnace equipped with four well-designed stoves 22 ft. in diameter, 100 ft. high, having 60,000 sq. ft. of heating surface each, should have no trouble in running on a straight line temperature of 1200 deg. Fahr., and still have plenty of reserve in case it is demanded by the furnace. The average stack temperature from such stoves should be below 400 deg. Fahr., nor should it be necessary to install five stoves in place of four if washed gas be used.

EFFICIENCY TEST OF A HOT STOVE

To obtain data on which to base future improvements, a two-pass Cowper type stove, outside diameter of shell 22 ft., height over all 100 ft., was tested. A gas burner is used of the Spearman type. The hot-blast nipple and water-cooled hot-blast valve used were also of standard type and size.

The author's summary of the test, which is reported in unusual detail, is as follows:

1. Improvement can be made in the distribution of gases through the checker work of the stove. The dome does not fully accomplish this. It may be possible that a baffle or change in bridge-wall height could be added to advantage in the dome.

2. The stove gives better efficiency when using three chimney valves.

3. Prolonged tests are practicable and give much more reliable results on which to base conclusions than do short tests.

4. A much more efficient burner can be perfected so as to get more efficient combustion. It may require gas and air regulators in order that we can premix just the right quantities of gas and air to obtain the best efficiency.

5. The velocity of the gas passing through the stove is very low compared with that of the air, and the air withdraws the heat from the stove much faster than the gas supplies the heat. This ratio is approximately that of the weight of gases flowing per hour.

6. Loss from chimney gases (approximately 20 per cent) is well worth saving by heat exchangers for preheating the blast before its entry into the stove or for preheating the air used for combustion of the gases burned in the stove. A very desirable arrangement would be a fan under slight pressure to force the air required for stove burners through a preheater of this kind. All the mixing should be done in the burner. The additional temperature of air and the slight forced draft would aid greatly in obtaining a higher combustion temperature in the lower part of the combustion chamber, shorten the flame, and confine all the combustion to the combustion chamber, so that the hot products of combustion alone will pass through the checker work. In many cases the combustion is not complete at the top of the checkers.

7. Radiation losses amount to from 7 to 12 per cent from the exposed surface of the stove. It may be possible to find a more efficient insulation between the brickwork and the shell.

WASHED GAS IN BLAST FURNACE STOVES

The use of clean gas in blast furnace stoves is absolutely necessary if we wish to secure the most efficient results. With clean gas, smaller checker openings can be used and greater heating surface obtained; we do not blow so much dust through hot-blast valves, pipes, tuyeres, etc., and they are not cut so badly, nor is nearly the amount of costly repairs required on this equipment or on the linings of the stoves themselves. We can also get perfect combustion with clean gas and have a uniform temperature at our command at all times for the blast furnace.

The most important point in all gas-washing processes is to cool the gas sufficiently to precipitate the moisture and eliminate it from the gas. The ideal condition for blast furnace stoves or boilers would be a hot gas containing neither dirt nor moisture, but very good results are obtained with a dirt content in the gas of 0.15 grain per cubic foot and a temperature of 70 deg., which corresponds to a moisture content of 8 grains per cubic foot at saturation.

THE TURBO BLOWER

Many claims are made for the turbo blower on account of its delivering a more uniform supply of air, effecting a lower coke consumption, greater production, etc. These claims look very questionable as it takes a definite amount of oxygen to consume a definite amount of carbon, no matter how it is supplied; therefore, in choosing between turbo blowers and gas blowers, it looks as if the efficiency and cost of the different kinds of prime movers, their operating cost and upkeep, and the fuel value in the district, alone should be considered.

Considering fuel costs, cost of installation, etc., the blast furnace gas engine would be the choice in most modern blast furnace installations, except where the value of fuel is very low, or where there is no outlet for excess power.

FUTURE DEVELOPMENTS

In conclusion, the author holds that our greatest economies in the future are to come from the economical use of the waste gases from blast furnaces, especially when connected with large steel works. We will secure these thermal economies, he says, by:

1. Increased efficiency of hot-blast stoves. This may be obtained by reducing the present losses due to radiation; the use of larger checker surfaces exposed to the passage of gases; more efficient burning of gas in stoves, and by the utilization of the waste heat from stove stacks for either preheating the blast before its entry into the stove or preheating the air for mixing with the gas for combustion.

2. Increased efficiency from blast furnace power plants by the use of gas engines or more modern steam equipment, and, when gas engines are used, increased efficiency will result from saving the heat of the waste gases and cooling water.

3. Increased efficiency thermally by utilizing the sensible heat at present lost in the molten iron and slag. This loss is quite serious, as the heat in pig iron amounts to 5.39 per cent, and the heat in slag amounts to 6.25 per cent of the total heat derived from the coke of the burden.

Discussion by Ambrose N. Diehl

Ambrose N. Diehl, Carnegie Steel Company, discussed the paper, in part, as follows:

An average for three years shows on the best representative present furnace with high heats, conditional material and modern equipment a daily tonnage of 529 tons with a coke consumption of 1925 lb. per ton. This furnace has a limestone consumption of between 800 and 900 lb. per ton, and is producing iron running about 0.04 per cent sulphur. In a few instances, under good conditions, coke consumption has been in some cases between 1600 and 1700 lb. per ton. The latter practice is obtained through the use of coke running about 0.5 sulphur and between 91 and 92 per cent fixed carbon, together with a coarse washed ore and sinter. The requirements are 600 to 700 lb. of limestone per ton of metal.

Fifteen years ago there were few so-called modern plants with which the present practice could be compared. The Duquesne furnaces of the Carnegie Steel Company might be termed pioneers in this development, and I wish to append for comparison the weekly practice of these furnaces for the years 1897, 1898 and 1899. A comparison of the Duquesne basic furnace No. 4 with the best practice shown over the years 1912, 1913 and 1914 shows very little difference in practice.

Average Practice at Duquesne Blast Furnaces for Years 1897, 1898 and 1899

	1897		1898		1899	
	Bessemer	Basic	Bess'r	Basic	Bessemer	Basic
Daily product	477	438	515	532	509	565
Coke per ton iron, lb.	1,940	2,016	1,939	1,842	2,059	2,001
Silicon in iron	1.11	1.00	1.17	0.53	1.24	0.59
Sulphur in iron	0.023	0.034	0.025	0.042	0.029	0.048
Ratio coke to ore	2.027	1.934	2.137	2.210	1.988	2.105
Per cent Mesaba ore used	37.48	36.88	36.05	36.57	33.13	39.83
Per cent flue dust made	4.1	5.3	5.5	4.5	4.8	4.0
Theoretical slag vol.	1,108	1,157	not calculated		not calculated	
Silica in slag	33.03	32.96	33.53	32.16	33.75	33.11
Alumina in slag	14.01	14.37	14.46	14.56	15.00	14.34
Cu. ft. air per min.	40,352	37,244	47,280	45,827	53,765	54,423
Cu. ft. air per ton iron	118,096	121,044	not calc'l'td		146,566	134,352
Cu. ft. air per lb. coke	60.7	60.0	not calc'l'td		74.0	67.3
Silica in ores	5.8	6.2	not calc'l'td		not calculated	
Heat in blast, deg. F.	925	950	976	1,038	943	1,025
Per cent limestone	24.5	24.3	not calc'l'td		22.4	21.5

Three furnaces, Nos. 1, 2 and 3, working Bessemer; one furnace, No. 4, working basic.

OBSTACLES MET BY FURNACE MANAGERS IN FIFTEEN YEARS

With the advent of higher percentages of physically fine Mesabas, economies in the manufacture of coke and the entrance of other coal fields which lowered the efficiency, physical strength and structure of the coke, practice changed. Furnaces became more irregular, and slips, with excessive losses and high coke consumption, resulted.

Progress in economies and efficiencies of operation did not stop with ore and coke managements, but the germ seemed to enter the steel consumer as well. Specifications, chemical and physical, became more rigid and all sorts of tests were advanced. The result was an extreme pressure on the blast furnace from two convergent sides, namely, to make better and more economical product with worse material.

The City Iron Works, Portland, Ore., have recently moved to their new building at 107 North Second Street, which has been fitted with new and modern equipment. The company is working to capacity, completing subcontracts on the new Couch and Shattuck schools, etc. Its products are ornamental iron and wire work, sheet iron, brass and bronze work, smoke-stacks, boiler breeching, and tanks.

CLEANING MACHINED PARTS

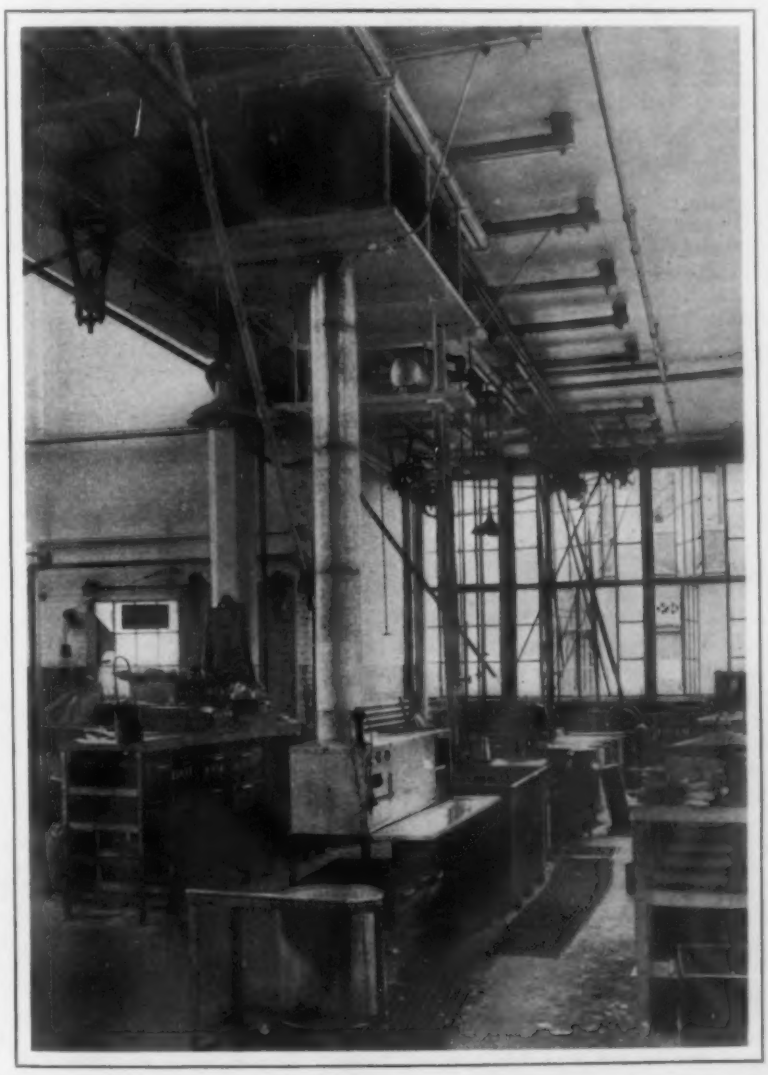
How Articles in Manufacture Are Treated in a Detroit Plant.

A new type of cleaning and drying machine designed to eliminate a large amount of hand labor and to replace soda kettles and gasoline cleaning has recently been installed in the cleaning department of the Burroughs Adding Machine Company, Detroit, Mich. As this company's manufacturing processes require the cleaning of a very large number of small parts between various operations, its cleaning department is unusually important.

Work to be cleaned is placed in wire baskets about 15 in. square and these baskets are hung on rocker arm suspension rods and immersed in a steel tank 5 ft. long, 3 ft. wide and 3 ft. deep, shown near the center of the photograph. The rocker arms carrying the suspension rods have a sufficient throw to raise the baskets and work out of the cleaning solution and to immerse it completely at every revolution. The drive for the suspension rod shaft is provided by pitman and crank on the driving shaft. The suspension rods are adjustable so that the distance the baskets are raised and lowered may be regulated to meet requirements.

After the parts are cleaned by the raising and lowering in the baskets in the solution as described, the baskets are carried into a special type of drying oven, the baskets running into the oven on rollers placed on an incline. This dryer is shown in the center of the photograph. The baskets, filled with parts, are then dipped into an oil tank and placed on a drain board to allow surplus oil to drain off. By the use of the mechanical agitator and the type of oven employed, work is carried through the three operations without removing it from the baskets.

The work passing through the dryer is dried by forced, heated air that is first drawn through a steam-heated coil by a Sirocco pressure blower, the coil and blower being mounted overhead. The air, heated to a temperature of about 208 deg. Fahr. passes at the rate of 1000 cu. ft. per minute through the dryer, the far end being open.



Wire Baskets Containing Parts to be Cleaned Are Soused in the Tank in Center, then Put into the Hot Blast Drying Oven Shown and Dipped in Oil and Drained on the Pan in Foreground

The Steel Industry and a Year of War

Dr. E. Schrödter Reviews Conditions in Four Leading Countries—Germany's Manganese Needs Supplied—American Prosperity Underestimated

A review of the steel industry in the first year of the war is given by Dr. E. Schrödter of Dusseldorf in the last issue of *Stahl und Eisen* to reach this country—that of Aug. 5. Considerable extracts are given below:

THE GERMAN STEEL INDUSTRY

Hard work under difficult circumstances characterizes the activity of the German iron industry in the first year of the war. In the last year of peace, 1913, Germany mined about 35,941,000 metric tons of domestic iron ore and produced out of this, outside of a sale for export of 2,613,000 tons and an importation of 14,019,000 tons of ore, a total of 19,300,000 tons of pig iron; that is, about 40 per cent of the metal content of our pig iron came from foreign sources. The necessary fuel, with a few minor exceptions, was domestic. But we were dependent on foreign sources, not only as regards our imports of iron ore, but in much greater measure was this the case as to the sale of our products in finished and semi-finished steel, for in the same year, 1913, our exports of iron and steel, including machinery, figured back to pig iron, were not less than 46.6 per cent of the year's production. That an industry which, in so great measure, depended on its foreign relations both as to imports and sales, should be thrown into the most intense suffering by the unexpected outbreak of war is easily understood.

At the regular meeting of the Association of German Steel Makers on Jan. 31, 1915, I gave a detailed account of this, and I was also able there to call attention to the gratifying resuscitation which had set in a few weeks after the first stagnation and to the effective transformation which had already made itself manifest. Since then the rate of production has not only been maintained, but it has increased in a satisfying degree. A large number of blast furnaces are again in blast and others are constantly being lighted. Though the average production of each furnace has decreased as a result of poorer ores, yet the daily output of 18,925 tons in August, 1914, has grown to 31,400 tons as the average of the last few months.

The steel production has developed in a similar manner. From the low figure of 18,310 tons per day in August, 1914, it has advanced to an average daily output of 33,000 tons in 1915. It is self-evident that the activity of the rolling and other mills was correspondingly greater.

LACK OF MANGANESE

A special writer in the London *Times* last spring figured that the German steel industry would have to stop by June, 1915, because of a lack of manganese. The hail of the steel of our guns has demonstrated that this estimate also belongs to the enemy's many false computations of this war. The production of our iron industry, dependent on domestic raw materials as it now is, is so great that it fulfills not only all the demands of our army and fleet, but also the necessary current needs of steel for domestic purposes and even to a certain extent the wants of our neighboring neutral nations. This gratifying achievement is public knowledge. How we protect ourselves in our raw materials is our own metallurgical secret which we have no occasion to reveal to our united enemies. So much, however, may they know—the idea of a dearth of steel for our war needs because of a collapse of our steel industry is a miscalculation the same as the plan to starve out our population during the war has proved itself ridiculous.

German science, German technique, German organization, and the adaptation of the German industries, regarded as makeshift by the British, triumph in irresistible victory over all difficulties which the German people are made to meet. This great success of ours is the more noteworthy in that, since the beginning of the war, our iron industry has been hindered in increasing degree by the constantly increasing legal restrictions and the limitations to its mobility caused thereby.

The fact cannot be gainsaid that the foundations for the maintenance of our steel industry on its present scale will continue unimpaired, even should the war last an innumerable term of years.

THE FRENCH STEEL INDUSTRY

As to the French iron industry it is conceded that of the normal output not less than 85 per cent is in German-held territory. On the other hand, that country can draw on the iron-ore deposits of Normandy and the Pyrenees as well as bring ore in on the Mediterranean, especially from Algiers and Spain. By this means without doubt France can operate her remaining blast furnaces and steel works, especially those with open-hearth furnaces, and produce, even under the circumstances, sufficient material for war needs so that the plants in central France near Paris and those on the sea coast can operate.

Commenting on the exceptions taken to his estimates of the amount of France's coal in German hands (65 per cent), published in THE IRON AGE of March 18, 1915, Dr. Schrödter says:

Official estimates place this year's coal output of France at the most at 18,000,000 metric tons, against 40,000,000 tons in normal times. Besides this the usual imports from German and Belgian sources of 10,000,000 tons are lacking. The supply thus falls short of the normal annual needs of 60,000,000 tons by not less than 32,000,000 tons, which England should supply, though normally it exports only 10,000,000 tons to France. While the price of coal from northern France is artificially held at 28 francs per ton, more than 52 francs must be paid for the imported coal at all ports. It is evident that the question of coal is a "burning" one, that it is France's weightiest industrial problem and hence the cry for state help is heard.

A strong movement is on in France to bolster up the export trade by politically and industrially organized measures, but in the meantime France's exports have fallen off considerably. The official figures, recently made public, show the decrease in iron and steel manufactures in 1914 to be 50 per cent from the total of 1913. The exports for 1914 are about equal to those of the first seven months of 1913. Exports of scrap, however, have doubled, evidently because of Italian demand.

THE BRITISH SITUATION

In England the disorders in industrial operations resulting from the war have constantly increased in the year. Though the official data of the output of mines and iron and steel plants are not yet made public, nevertheless we know with certainty that the coal output is nearly 3,000,000 tons per month less than that of normal times. The recent strike of the Welsh miners has caused a decrease of at least 1,000,000 tons.

The production of pig iron has had to battle with constantly increasing difficulties. A picture of these can easily be drawn because the freight from Bilbao for iron ore has risen three and four times the normal rate. The exports of iron and steel manufactures, which were to absorb the German field, have not realized this expectation, but have shown an almost uninterrupted decline which in the war months from

August, 1914, to June, 1915, was 41.1 per cent from those of the same period of the previous year.

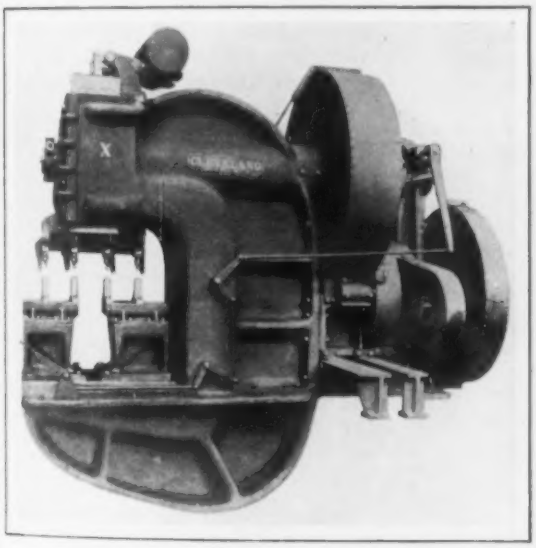
THE AMERICAN STEEL INDUSTRY

In the United States the railroad reports, the number of bank failures as well as the complaints as to unemployment indicate that the entire industrial life has not improved as was assumed by the Chauvinists who hoped for great advantages as a result of the elimination of German world competition. The production of pig iron which in August, 1914, was 65,393 tons per day, in December has decreased to 49,678 tons but in May, 1915, it had advanced to 74,180 tons per day and in June to 80,160 tons.

It is astonishing, however, that the effect of the flow of orders for war material, which our enemies have showered on American plants and which have given rise to many new expansions, has not been more marked on the general current of that country's iron industry. While on the one hand the war industries have made great gains, on the other hand American industrial life has suffered enormously. It can be said to-day with certainty that the hemming in to which Germany is subjected by England's blockade will lead to a lasting falling off from our former large imports from North America, among which oil and copper may be mentioned. A later reckoning will show whether the present gain in war materials may not be at the cost of lasting damage to American exports to Germany.

Punch for Large Bethlehem Shapes

Among a number of new machines recently built by the Cleveland Punch & Shear Works Company for the Bethlehem Steel Company is a special punching machine of unusual size and weight. The machine is designed to perform all operations required in the fabrication of the heaviest Bethlehem sections. The frame is of solid construction, heavily ribbed and reinforced in various parts to withstand the severest service.



Cleveland Built Punch for Bethlehem Shapes

The shafts are forgings and the main shaft is bronze bushed at bearing points. The plunger, bolster block and the gears are steel castings. The punch holder and die sockets are forged steel, finished all over. The bolsters are designed so that Bethlehem sections may be punched in flange and web without change of tools. Safety requirements are provided for, all gearing, as well as the flywheel, being completely guarded.

The machine has a capacity to punch eight 1-in. holes in 1-in. material and weighs complete 86,000 lb. It is driven by a 40-hp. direct-connected motor.

The electric furnace of the Niagara Electric Steel Corporation, North Tonawanda, N. Y., installed by the Snyder Electric Furnace Company, Chicago, has now been in operation for two weeks. It has melted down cold steel scrap and refined with two slags.

HEAT TREATMENT OF GEARS

A Process Which Produces a Hard Exterior on a Tough Interior

The production of integral steel articles, such as gear wheels or pinions, having a hardened exterior surface, especially adapted to resist abrasion or wear, and a tough or ductile interior especially adapted to resist strain or shock, is the purpose of an invention (U. S. 1,122,193) granted to Prof. Henry M. Howe of Columbia University, New York. The steel as a whole, after treatment by the new process, is said to be able to resist simultaneously both wear and shock in an unusual degree. The invention may be applied not only to gears or pinions but also rings or cylinders requiring a hard inner surface. The patentee's aim is the formation, on the surface of the article, of a steel alloy in the martensitic condition while the remainder of the steel, its body or the interior parts, is to exist in the austenitic state. The original patent specification very clearly discusses what is meant by a "steel alloy" and differentiates in detail the austenitic, martensitic and pearlitic structures.

Professor Howe's process is carried out by the casting, or forging of a steel having a composition capable of existing in the states of austenite and martensite. This is then treated according to one of the following methods so as to produce the martensitic condition in that portion which is to be made wear-resistive and the austenitic condition in the rest of the steel:

1. To manipulate the temperature of the different parts so as to produce austenite in the one part and martensite in the other.

2. To shift the metal in part of the object into the martensite state by mechanical deformation.

3. To vary the composition, relatively in the two parts so as to make one part so rich in the obstructive elements, manganese, nickel and carbon that it may remain as austenite and the wear-resistive part less rich in such obstructive elements so that it may slip into the martensite state under proper treatment.

4. A combination of these different methods using each to reinforce the effect of the other.

In the case of small pinions, the whole is quenched from a temperature high enough—well above 1050 deg. C.—to cause the whole of it to remain austenitic and then to reheat the surface or wearing parts to a temperature at which they become martensitic, quenching the whole lest the change goes too far and either too much of the austenite changes to martensite or too much of the martensite changes to pearlite. The martensite thus produced is disposed for a slight depth on the pinion and is so supported by the body of austenite into which it merges that its natural tendencies to crack or splinter under shocks or blows are avoided, the whole article being exceedingly durable and capable of long wear. Other applications of the various methods are described in the patent specification.

The H. W. Johns-Manville Company, which has conducted its general offices in Milwaukee, Wis., since moving its main works to that city from New Jersey, on Sept. 7 transferred the executive departments to Chicago. Thomas T. Lyman, general manager, takes charge of the Chicago offices, with which are consolidated the Chicago branch offices under the name of Central Western office. C. B. Manville, president, will be in charge of manufacturing operations in Milwaukee for the time being. The company operates two distinct works in Milwaukee.

Iron, Steel and Machinery Exports Mounting

July Makes a New High Record in Tonnage—Outgoing Metal-Working Machinery Nearly $24,000,000 for This Year

WASHINGTON, D. C., Sept. 14, 1915.—The influence of the European war upon the domestic iron and steel industry has never before been so clearly reflected in current official statistics as in the figures just made available by the Bureau of Foreign and Domestic Commerce showing the imports and exports for the month of July and for the seven months ended July, 1915. As these statistics date from the beginning of the present calendar year, thereby eliminating the depressed period which began with the declaration of war early in August, 1914, and continued to the end of the year, they represent an industrial revival that has not only restored our export trade to the comparatively low level of 1914, but has carried it far beyond the very satisfactory figures of 1913.

The official statistics show a decline in imports of tonnage iron and steel for the month of July and for the seven months of 1915 as compared with 1914, but a gain in exports of more than 200 per cent for July and of 75 per cent for the seven months. Shipments of machinery during July rose 42 per cent and during the seven months recorded a gain of 9 per cent, the figures for July exceeding those of that month in 1913 as well as in 1914.

The exports of iron and steel for which quantities are given aggregated in July, 1915, 368,893 gross tons, as compared with 114,790 tons in 1914 and 237,160 tons in 1913. The gain over the figures of July, 1913, which amounts to more than 50 per cent, is even more significant than the 200 per cent increase recorded over the relatively low figures of 1914. The total for the seven months ended July, 1915, was 1,676,485 gross tons, a heavy gain over the corresponding month of 1914, when the aggregate was 959,825 tons, and but little less than the high figures of 1913, when the total was 1,744,522 tons.

Totals of the exports of these tonnage commodities in July and for the seven months ended July, 1915, as compared with the corresponding periods of 1914, are as follows:

Exports of Iron and Steel for July and the Seven Months Ended with July—Gross Tons

	July		Seven Months	
	1914	1915	1914	1915
Pig iron	9,371	21,859	80,381	109,040
Scrap	3,642	728	27,493	21,275
Bar iron	556	6,712	2,763	16,038
Wire rods	347	16,008	38,381	91,072
Steel bars	8,164	49,524	67,744	219,371
Billets, ingots and blooms, n.e.s.	2,955	67,121	29,899	263,985
Bolts and nuts	1,280	3,010	10,017	10,120
Hoops and bands	846	2,142	5,775	12,213
Horseshoes	82	2,462	700	10,193
Cut nails	335	568	2,812	2,265
Railroad spikes	813	1,090	4,704	3,642
Wire nails	2,474	10,514	18,215	45,604
All other nails, including tacks	212	777	1,605	4,442
Cast pipe and fittings	17,332	3,872	121,819	27,844
Wrought pipes and fittings	.....	11,484	.....	72,463
Radiators and cast-iron house heating boilers	253	252	2,809	1,186
Steel rails	9,550	31,802	119,235	126,394
Galvanized iron sheets and plates	3,103	12,373	24,771	48,533
All other iron sheets and plates	823	3,094	5,351	9,594
Steel plates	7,172	31,871	71,460	108,300
Steel sheets	9,663	9,074	82,324	57,366
Structural iron and steel	14,388	26,151	118,316	116,348
Tin and terne plates	8,213	13,845	34,762	60,855
Barbed wire	7,074	29,986	42,894	119,551
All other wire	6,142	22,574	46,315	121,791
Total	114,790	368,893	959,825	1,676,485

The imports of iron and steel for which quantities are given amounted to 20,857 gross tons in 1915, as compared with 24,958 tons in the same month of 1914. The total in July, 1913, was 39,694 tons. For the seven months ended July, 1915, these imports amounted to 124,636 gross tons, as compared with 167,210 tons in 1914 and 205,475 tons in 1913. Pig iron was the chief item in July, but for the seven months steel rails made the highest record, with pig iron and scrap following in the order named.

The details of imports of tonnage commodities in July and for the seven months ended with July, 1915, as compared with the corresponding periods of 1914, are as follows:

Imports of Iron and Steel for July and for Seven Months Ended with July—Gross Tons

	July		Seven Months	
	1914	1915	1914	1915
Ferrosilicon	623	234	3,473	3,546
All other pig iron	11,526	11,943	70,390	41,025
Scrap	3,056	3,250	18,882	16,894
Bar iron	3,001	1,136	11,818	5,222
Structural iron and steel	671	108	6,150	1,027
Steel billets without alloys	216	62	1,507	1,035
All other steel billets	3,395	753	24,480	6,512
Steel rails	1,236	3,017	9,270	43,572
Sheets and plates	486	79	2,850	692
Tin and terne plates	342	70	13,070	2,139
Wire rods	406	205	5,320	2,972
Total	24,958	20,857	167,210	124,636

The recent rapid expansion in the exports of machinery of many kinds is reflected in these statistics. Shipments of metal-working machinery have constituted an overshadowing item in this class of exports since the beginning of the war, but for several months no other class showed a gain over the low figures of 1914. In July of the present year, however, although metal-working machinery recorded an increase of nearly 400 per cent, no less than 15 other classes showed totals exceeding those of 1914, the most important gains being credited to steam engines and parts, milling machinery, mining machinery, shoe machinery, sugar-mill machinery and windmills. The total for the seven months ended July, 1915, was $67,956,822, a substantial gain over the exports of the same period of 1914, which amounted to $62,562,783. Shipments of metal-working machinery, which amounted to about 35 per cent of the total during the seven months of 1915, show a phenomenal gain of 218 per cent over the same period of 1914. Engines, milling, mining, paper-mill, refrigerating, shoe making and textile machinery were the only other classes showing gains for the seven months of 1915.

EXPORTS OF MUNITIONS

The Bureau of Foreign and Domestic Commerce has compiled a statement showing by months the exports of ammunition, explosives and firearms from the United States during the period covered by the European war from Aug. 1, 1914, to June 30, 1915, as follows:

Exports of Ammunition, Explosives and Firearms from the United States

Months, 1914	Cartridges, Dollars	Gunpowder—Pounds	Gunpowder—Dollars	Other Explosives, Dollars	Firearms, Dollars
August	154,080	30,948	16,821	26,336	208,644
September	421,982	193,037	65,465	187,510	201,556
October	1,452,740	90,982	24,395	56,305	692,146
November	1,231,235	63,064	23,027	78,062	1,194,510
December	1,098,875	55,352	27,989	980,665	1,093,158
1915					
January	1,381,970	372,085	129,617	1,059,961	2,156,737
February	1,900,774	73,015	34,884	1,020,904	584,494
March	1,616,626	181,043	65,481	1,081,860	545,716
April	2,648,667	645,690	417,919	2,863,014	464,313
May	3,028,083	1,591,136	1,048,607	4,439,777	1,101,751
June	2,467,378	4,376,677	3,234,549	5,911,186	914,118
Total	17,402,410	7,673,029	5,088,754	17,705,580	9,157,963

Under the head of "other explosives" in the above table, all the shrapnel exported in loaded condition are included, also all shipments of guncotton, nitroglycerine, etc. Shrapnel exported unloaded are included in the total of "all other manufactures of iron and steel," which for the fiscal year 1915 were valued at $20,234,737, as against $18,230,560 for 1914. This increase of 11 per cent is highly significant when the fact is borne in mind that the total exports of iron and steel products during the fiscal year declined 10 per cent.

The following table shows the total exports of machinery for the month of July and for the seven months of 1914 and 1915:

Exports of Machinery for July and the Seven Months Ended with July

	July		Seven Months	
	1914	1915	1914	1915
Adding machines	$127,428	$68,705	$1,056,468	$268,530
Air-compressing machinery	49,062	23,987	275,025	247,600
Brewers' machinery	31,092	10,464	139,787	52,656
Cash registers	336,395	156,254	2,792,020	783,396
Parts of	*28,132	14,627	*28,132	62,987
Cotton gins	12,034	5,592	93,072	29,490
Cream separators	22,588	31,200	237,817	156,870
Elevator and elevator machinery	95,956	90,608	722,216	468,132
Electric locomotives	40,100	.....	455,892	134,238
Gas engines, stationary	18,478	30,395	220,346	316,761
Gasoline engines	383,443	321,755	3,776,072	3,081,395
Steam engines	195,402	372,966	2,355,393	1,933,113
All other engines	48,567	57,330	458,673	557,791
Parts of	222,807	644,606	1,708,938	2,363,865
Laundry machinery, power	39,080	31,143	270,747	192,233
All other	29,421	23,433	373,492	136,486
Lawn mowers	31,174	18,180	328,373	230,699
Metal-working machinery (including metal-working tools)	810,247	3,872,358	7,579,116	23,962,815
Meters, gas and water	†42,995	22,135	†42,995	157,079
Milling machinery (flour and grist)	134,539	295,451	617,412	1,323,034
Mining machinery:				
Oil-well machinery	‡287,934	126,567	‡287,934	781,849
All other	‡505,606	569,467	‡505,606	2,924,528
Paper-mill machinery	78,405	128,455	368,196	520,632
Printing presses	207,510	163,781	1,439,161	889,446
Pumps and pumping machinery	295,612	277,986	1,999,359	1,581,692
Refrigerating and ice making machinery	35,348	74,795	393,445	498,736
Sewing machines	856,102	572,925	6,402,169	3,683,751
Shoe machinery	79,430	174,287	722,933	870,774
Sugar-mill machinery	82,771	245,886	686,012	1,127,006
Textile machinery	172,031	180,999	793,160	1,019,724
Typesetting machines	161,029	34,119	1,219,797	236,202
Typewriting machines	768,690	672,730	6,333,243	3,979,272
Windmills	76,829	129,640	814,167	490,945
Wood-working machinery, sawmill	40,259	20,239	375,807	212,053
All other	65,467	65,630	651,359	446,393
All other machinery, and parts of	1,648,651	1,880,928	12,109,818	12,234,649
Total	$8,060,614	$11,409,623	$62,562,783	$67,956,822

*Included in cash registers prior to July 1, 1914.
†Included in all other machinery prior to July 1, 1914.
‡Not stated separately prior to July 1, 1914.

Changes in classification explain the fact that the figures for parts of engines, refrigerators, gas and water meters, oil-well machinery and other mining machinery are identical for the month of July and for the seven months ended July, 1914. Up to the beginning of the fiscal year 1915 parts of cash registers were included with registers, gas and water meters were included with all other machinery, and oil-well machinery was not segregated from the general class of mining machinery.

W. L. C.

AMERICAN MACHINERY EXHIBIT

An Opportunity in Connection With the Industrial School of Argentina

WASHINGTON, D. C., Sept. 14, 1915.—American manufacturers are earnestly invited to co-operate in the installation of an exhibit of working models of machine tools, engines and various types of special industrial machinery, to be employed as an adjunct of the Industrial School of the Nation at Buenos Aires, Argentina. The invitation has been forwarded to the Department of Commerce by J. A. Massel, special agent of the Bureau of Foreign and Domestic Commerce, who has recently made a tour of South America for the purpose of investigating markets for American machinery. Mr. Massel says:

"The Industrial School of the Nation is a technical institution for the purpose of giving the proper theoretical and practical training to young men desirous of becoming competent to manage and direct industrial and constructive work. With this object in view, the studies are divided into four branches, and it takes six years to graduate, four of which are dedicated to theoretical studies and two years to practical training in the various shops of the school, and when through they become either mechanical, electrical or civil engineers or chemists. For this purpose they have established a foundry, machine shop, carpenter shop, electrical workroom, laboratory and special railroad material showroom, fully equipped with working models and sections of every description. Besides they have a separate museum of working models in the mechanical, electrical and other lines, exhibiting pumps, engines and every other mechanical appliance.

"I was very much impressed and surprised to know that the great percentage of the machine tools in the shops and practically all the working models, samples, etc., in the museum are principally of German make, followed by those of English, Belgium, French and other European countries, and none of our make, and it was explained to me that all of the models were sent gratis, as well as many of the actual tools in the shops. Senor Bertucci told me that just before the European war broke out a group of German manufacturers offered to send a complete equipment of modern tools for their shops, provided that the school would eliminate all the tools of other than German make. The purpose is self-evident.

"The institution is being attended by about 550 students, who work and study on the tools and models, and there are thousands who visit the school every year to look at the models displayed in the museum, while the students themselves are being instructed from German books translated into Spanish, and what are the results it does not require to think very much.

"The Germans have shown their farsightedness and are getting the benefit of it. Why should we not adopt the same methods when the opportunity is given us? The director of the school, Senor Latzina, is willing to dedicate special space for American exhibits. Now is the time to do it, and to do it without delay, because the space is limited, and if you don't do it some one else will do it, and this is the best medium of advertising there possibly can be. Get together and avail yourselves of the golden opportunity and send models of your products to this school."

Accompanying Mr. Massel's report is a letter from Senor Latzina, who incloses a list of machines and equipment which the school will be glad to receive. He says the exhibit might take the form of actual machines, models of machines or of civil engineering works, tools, construction materials of all sorts, etc. The Bureau of Foreign and Domestic Commerce will be glad to correspond with American manufacturers who desire to take advantage of this opportunity of placing their products on exhibition in the manner suggested.

W. L. C.

Some Problems in Burning Powdered Coal

Experience Gained from Experimental Work at the Schenectady Plant of the General Electric Company—Apparatus Employed and Behavior of Powdered Coal

Powdered coal has been burned for years. It is more difficult to burn it beneath a boiler than it is in a forge furnace or in a cement kiln.

It seems simple enough to drop coal down a pipe by a screw feed, to pick it up with a cross current of air which carries it along to a furnace; and it is simple, provided the rules are obeyed. But such a plan is not very economical; the mixture is not good and some of the coal is long in burning; the fire may do the work required of it if there is room, but it will not give a high initial temperature; it will not have completed its burning in 15 in. or so; perhaps not in 15 ft.

Coal acts like other dust. Some of it is picked up on an eight-mile breeze but it will not stay in suspension at that speed; double the velocity to 1500 ft. per minute and most of it will stay up, though 2000 ft. is none too high for general work.

It is not good practice to send such a current at such a speed into a furnace. The combustion of carbon compounds is best at high temperature; the sooner it is over the better, and it requires a perfect mixture. A particle of coal speeding along parallel with an air stream has no inducement to mix with 10,000 air volume units, which it must have for its combustion. Such stream lines should be broken up.

There are many ways of stirring things up. In one case we let the stream make a sharp turn with fair results: but more than one turn is needed and such turns take up room. One general rule may be stated: it is easier to make the mixture (it must be done in one-third second or less) if all those ten thousand volumes are not put in at once. Two, three, even five divisions are much better if the quantities are great. A pail of meal and water is better intermingled if the meal is added in small quantities; time is lost if all of both elements are brought together at once.

A device which is being used successfully to perfect a mixture and at the same time reduce high velocities is shown in Fig. 1. It consists of a cast-iron cylindrical box 8 in. in diameter with five openings besides its discharge mouth. Either opening *S* or *T* is used for coal and its primary air, or

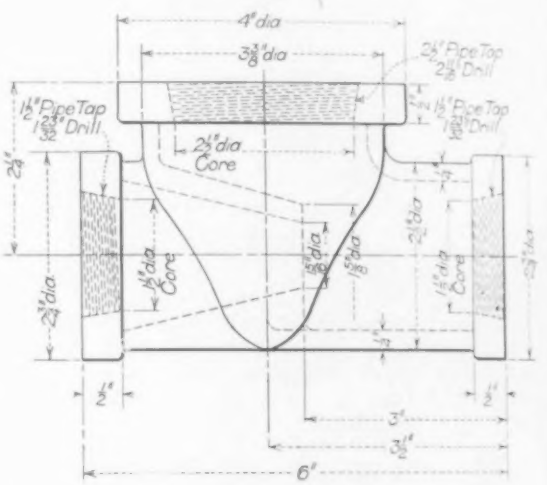


Fig. 2—Fitting for Introducing Primary Air for Carrying the Coal

carrying air (40 to 60 cu. ft. per pound of dust). Either *X* or *Y* is used for the combustion air and sometimes air is admitted at the end *U*. The first four of these openings are tangential, causing the currents to take irregular spiral forms, and they are used for short burning.

For an ordinary forge furnace, say 4 x 5 ft., *S*, *Y* and *U* will be piped up. A fire is started by using combustion air through *Y* alone, for through its use a short complete mixture can be dropped right upon burning kindling, and so long as this arrangement is preserved the high temperature will be near the tuyere, and perhaps 12 in. in front of it.

It sometimes happens that with short work it is not necessary that a furnace be hot all over and fuel will be saved if there be a high local temperature only. If a complete and uniform heat is wanted additional combustion air is admitted at *U* and there is an immediate change in the character of fire. The flame is no longer local: the mixture is not so good and burning calls for more time. Coal that can find adequate air near the tuyere burns there; other coal waits till it finds air, and there is a long flame in consequence. By manipulating the air valves at *Y* and *U* the range of regulation is great and it is possible to make a very long flame, even 30 ft. under certain conditons.

The same is true of an oil fire. If mixtures are only poor enough and oil is sent from the burner in chunks large enough, a flame of great length is attainable; it is only requisite that the fuel and air travel in parallel streams, whatever

*From an article by Arthur S. Mann in the *General Electric Review*.

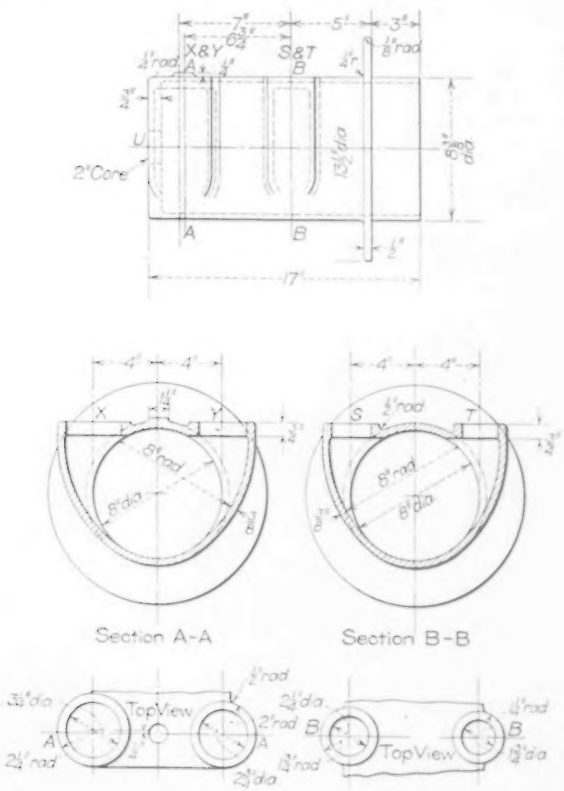


Fig. 1—Device for Mixing Air and Pulverized Coal for Combustion

the nature of a suspended fuel. Such long flames are not economical; good mixture gives good economy.

It must be remembered that the velocity of the stream passing along the axis of the burner must not be low enough to drop the coal, so a burner must not be too large if a short fire is wanted.

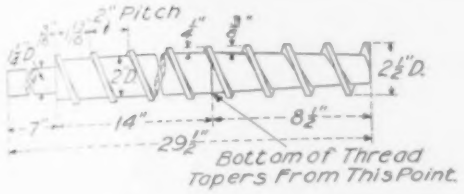


Fig. 3—Screw for Feeding Pulverized Coal

When two air streams (as at *S* and *Y*) rotating in counter directions meet, the rotation becomes nil and the axial speed must be enough to keep the coal in suspension and preserve the mixture already made.

It will be noted that the rotary motion within this burner is just the motion used in a centrifugal separator to draw moisture out of steam, or in a dust collector to separate air from solids. In these devices either the body diameter is large enough to keep the two elements apart, or baffles are provided to trap the heavier material. Then there are separate and guarded outlets for the two components, all of which are not true of the burner. That the device does produce a mixture is shown in its operation; for even when openings *S* and *X* are used, causing both sets of air to swirl in the same direction, the flame is only about 24 in. long, and as the combustion air at *X* is reduced and the air at *U* increased, the flame length is increased and combustion becomes slower, showing a less perfect mixture. Some of our furnaces are piped in just that way and though the range is not so great it is ample for most forging work.

We have found that a simple screw will answer every purpose. The feeder draws coal from a supply tank and delivers it in definite amounts to a cavity in which it can be picked up by the primary or carrying air; and therefore more than one speed is required. In the plant under consideration the feeder is driven by a little motor which can turn at 1800 r.p.m., 600 r.p.m., or any intermediate speed, and is geared down only once. We therefore made a screw that will feed at 300 or 600 turns per minute, or more if required. With so wide a speed control it is possible to carry a fire that shows just a visible red: by a simple movement of a rheostat handle this same fire will spring up vigorously and shortly give a temperature high enough for any forge work.

There is a feature of the plain screw feed that makes it very convenient in many situations; viz., it can stand a little back pressure so that discharge distances may be long. In the installation under consideration the coal is being fed across a shop, that is, the supply tank with its feeders and motors is fixed to the shop wall, out of the way. A 2-in. pipe is led along underground for 90 ft. or more, then up to a furnace and its burner. The distance could be much greater, even a few hundred feet, and the control would be just as convenient and exact because the switch and rheostat are located at the side of the furnace, and the operator has no occasion to come over to the supply tank. In all these long transmissions there will be a little back pressure at the screw.

Primary air is introduced on the eductive principle, using the fitting shown in Fig. 2. The resistances on the discharge side increase with distance. If the distance is short, we have a negative pressure in the pipe leading from the end of the screw to the opening *A*, Fig. 2. Eight inches of vacuum, by water column, is easily attainable. As the discharge distance increases with addition of elbows and crooks this vacuum falls and we may have even 5-in. pressure.

The screw and its feeder box are shown in Figs. 3 and 4 respectively. While usually only a small amount of power is needed to turn the screw (it can be turned with the finger fast enough to carry a moderate fire) there are times when considerable power is required. Normally the coal is light and fluffy, but under certain conditions of long standing coal can pack so tightly that no mechanical device can move within it. The screw is cut in a lathe with spaces proportioned to the quantity required. A 2½-in. diameter screw, as shown, will feed 700 lb. per hour, and with slight modification much more. The bottom of the thread is tapered so that after the screw had taken its bite, the volume increases as a threadful advances, and the flow to the pipe is free and easy in consequence.

The weight of a cubic foot of coal may be anything from 20 lb. to 50 lb. As coal lies on a feeder screw it will not reach 20 lb. per foot. When delivered by a conveyor screw to a tank 7 ft. deep and measured immediately it weighs 31½ lb. per foot. In 24 hr. it will reach 35 lb. and increases in density till in six weeks without jarring, it will weigh 38½ lb. Now these changes will take place

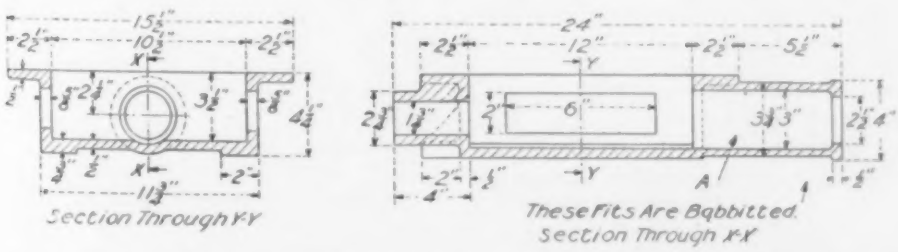


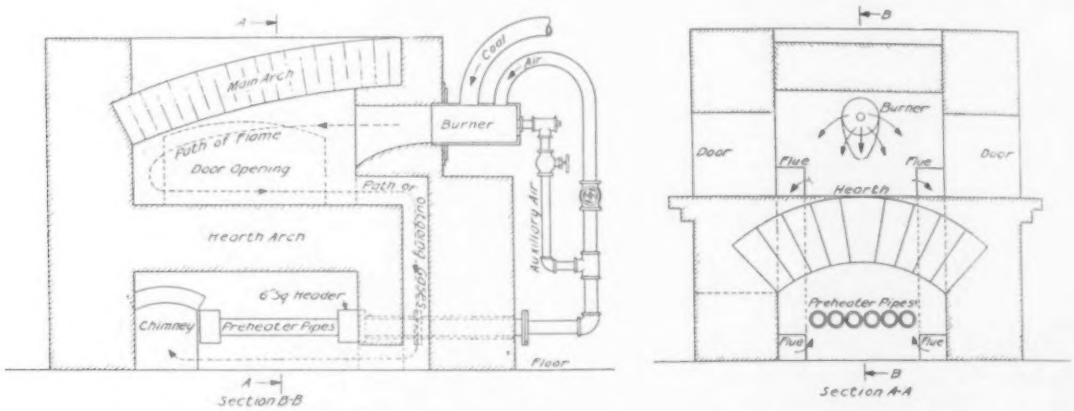
Fig. 4—Box for the Feeder Screw for Controlling Flow of Powdered Coal

in a container with smooth sides, or in one with a diameter equal to half its depth. In a piece of 6-in. vertical pipe 10 ft. 6 in. long, it was found that there was little settlement in two months. The pressure in the tanks, however, is computed at 35 lb. Sometimes the coal flows as freely as a liquid and will spread out its top surface nearly level in the tank. At other times it won't even flow down hill, though it always moves freely enough unless it has stopped for 48 hr. or longer. This tendency to pack and clog is due to the physical arrangement of the particles through settlement rather than to moisture.

As a rule two oil burners, if they be of the atomizing type, are required on an average furnace. An oil burner of the globular type needs a com-

bustion chamber of some sort. A coal furnace needs but one burner and calls for no combustion chamber. In every other respect the coal furnace is more complex than its oil counterpart. An oil fire makes no visible smoke and there is little or no odor from its products of combustion, so there is no reason why there should be a chimney or in many cases even a furnace vent. Flame and hot gases can be brought up to and passed out of the door, keeping the fronts hot.

A coal fire yields no black or colored smoke, though the gases contain some small particles of white ash, but it does have a decided and disagreeable odor. It is better then to provide a hood over the furnace door, enveloping it, if heat is wanted right at the door as it is in most forge work, and this hood must have an outdoor vent. If all gases are allowed to escape in this way, the heat distributed is not perfect, and therefore we like a chimney vent at an appropriate point. It is good practice to run this chimney up through the roof over each furnace and to cut into a 45-deg. Y to which the hood vent is attached and in which an upward draft is induced by the chimney draft. It pays to provide a nicely fitted damper which can be adjusted with precision: if the damper works on a screw thread the tips can be moved 1/50 in., though such a fine adjustment is not needed.



Furnace at Schenectady Works of General Electric Company, Using Preheated Air

It also pays to preheat the combustion air. The saving in fuel greatly exceeds that represented by the heat imparted to this air. It was found that a saving of 35 per cent was secured in one case with air heated to 334 deg. C. while the heat contained in the combustion air was only 16 per cent of that in the coal. Only a moderate air temperature was used, as it is preferable to install only such surface as can be readily cleaned, and the low temperature prevents burning out the preheating surface. It is good practice to allow 15 ft. of surface in a furnace that burns 100 lb. of coal per hour, with an inside temperature of 1355 deg. C.

The preheater is made of 3-in. cast-iron soil pipe, six lengths being rusted into a header at either end and placed beneath the hearth in the path of the waste gases. Two vertical sections of a furnace in the Schenectady Works are shown in Fig. 5. The hearth is 43 in. long and 24 in. deep, though this same design is being used for furnaces having twice the area.

The recently organized Wellman Valve Company, Sullivan, Ind., has elected the following officers: President, C. W. Wellman, Cleveland, Ohio; vice-president, W. T. Mellott, Sullivan; secretary, Ray R. Ross, Indianapolis; treasurer, John S. Taylor, Sullivan. For the present the headquarters will be at Indianapolis.

Further Restrictions on Tin Importations

Following the warning of Sept. 1 that British regulations governing the importation of tin and dealing in that metal must be more closeiy observed, the Tin Committee of the New York Metal Exchange announces the following amendments to the guarantees heretofore required, the changes to become effective Sept. 20:

The various forms of guarantee necessary to be filed with the British consul for the purpose of clearing importations of tin have been amended by the addition of the following clauses:

"All orders received by us for tin plates or tin canisters and tin boxes suitable for food packing made therefrom or for tin foil, solder, babbitt metal, type metal or any metallic alloys containing tin, to be sent to neutral European countries shall be executed from stocks maintained by us in the United Kingdom, or be executed by shipments to the United Kingdom and reshipment from there, under license to be obtained for export therefrom.

"We will not execute any orders for tin plates or tin canisters and tin boxes suitable for food packing made therefrom, or for tin foil, solder, babbitt metal, type metal or any metallic alloys containing tin, to be sent, either directly or indirectly, to any country or state at war with Great Britain. We will not sell any tin plates, or tin canisters and tin boxes suitable for food packing made therefrom or for tin foil, solder, babbitt metal, type metal or any metallic alloys containing tin to any person in the United States without satisfying ourselves that there is no intention on his part to export, or resell the same for exportation, to any countries in Europe other than Great Britain, France, Italy or Russia otherwise than by shipping to the United Kingdom and reshipping from there, under license to be obtained for export therefrom.

"If we export any tin plates or tin canisters and tin boxes suitable for food packing made therefrom, or tin foil, solder, babbitt metal, type metal or any metallic alloys containing tin to a destination outside of Europe not being in British possessions, we will, prior to or simultaneously with the shipment, give you particulars of the goods so shipped and their destination."

On and after Sept. 20 tin will be cleared only under the amended form of guarantee.

Exports of Bars and Rods

The effect of the war on the exports of bars and wire rods from the United States is shown by the following table compiled from Government statistics for June, 1915:

	Exports of Steel Bars, Gross Tons	Exports of Wire Rods, Gross Tons	Exports of Iron Bars, Gross Tons
June, 1914	11,129	12,375	333
June, 1915	58,364	18,132	2,273
Year ended June 30, 1913	231,091	74,823	22,958
Year ended June 30, 1914	149,113	56,492	10,299
Year ended June 30, 1915	234,738	98,039	12,344

While the increase in steel-bar exports for the fiscal year 1915 over 1914 was 85,625 tons, or 57 per cent, the increase over 1913 was only 3647 tons, or 1.6 per cent. This is surprising in view of the fact that eleven months of the fiscal year 1915 were war months. June exports this year were more than five times those of June, 1914. Exports of wire rods for the fiscal year 1915 were 73.6 per cent more than for 1914, but only 31 per cent more than for 1913.

Terms of Contracts for War Munitions

Stipulations Under Which Shrapnel and High Explosive Shells Are Now Manufactured in the United States—How Payments Are Secured

So much unnecessary secrecy and mystery have been attached to the manufacture of war munitions that many erroneous impressions are current in relation to the contracts under which they are produced. In reality, however, considering the great issues and amounts of money involved, these contracts are extraordinarily simple in their terms, and any one of them can be understood by the average manufacturer without difficulty.

Taking projectiles as the subject of most general interest, it may be said that contracts for either shrapnel or high explosive shells specify: 1, the government interested or the agent acting in its behalf; 2, the seller; 3, the total quantity or quantities to be delivered and the prices agreed upon for each; 4, the dates at which deliveries are to commence and be maintained, usually expressed in certain quantities monthly after a definitely fixed period of preparation.

The manufacturer, when ready to begin deliveries, is required to notify the agent of the purchasing government in writing. He will then be given written instructions covering the shipment of the shells; or, in the event that such instructions are not received within ten days after the notification of the manufacturer of his readiness to make deliveries, the shells manufactured may be put in storage for the account of the government concerned, all storage charges, if any, to be borne by the latter. Delivery f.o.b. at the works of the seller is usually specified, but freight allowance to New York City docks may be demanded.

SAFEGUARDS FOR PURCHASERS AND MAKERS

Within two days of signing the contract, the purchaser will pay 25 per cent of the total amount into the bank with which the manufacturer has a deposit account or other bank mutually agreed upon between the parties. This represents the *final* payment to be made under the contract and all but 5 per cent of it is inviolate for that purpose, this 5 per cent representing the maximum of penalties which it is possible for the purchaser to assess, as stated below.

The fund for the remaining 75 per cent, which will be covered by monthly payments in full for all quantities delivered, is established as a guaranteed, irrevocable dollar credit with a metropolitan bank acceptable to the seller. Payments from this credit are made upon presentation of invoices in triplicate, accompanied by bills of lading and proper certificates of inspection; or, in case shipping directions are not promptly received, there may be substituted receipts signed by the manufacturer to the effect that deliveries are being held in storage subject to the order of the purchasing government.

The bank representing the seller in turn binds itself, by suitable instruments, to the banking house with which the purchaser's credit is established, that in case of non-delivery of the shells in payment for which the cash was advanced the whole or a proportionate amount of it to cover the delinquent deliveries will be refunded. This makes it necessary to hold the 25 per cent deposit until the last.

Where, however, there is no question in the local banker's mind about the good faith of the seller and his ability to fulfill his part of the contract, it is customary to loan him up to 20 per cent of the amount placed on deposit. This accordingly serves as a fund with which to provide any new equipment or plant buildings needed and get ready to turn out the shells. As deliveries begin to pass the last quarter, a proper proportion of four-fifths of the deposit can also be released.

As a part of the contract to make deliveries within the time limits imposed by the contract, the manufacturer agrees to pay as liquidated damages for each day in excess of 30 days' delay, one-fourth of 1 per cent of the value of all shells which he has failed to deliver in the 30 days after such delivery was due. But the reservation is expressly made and agreed to by the purchaser that "should such failure to deliver the shells guaranteed be due to a breakdown in the seller's plant, or to strikes, to the destruction of the seller's plant from fire or explosion, to the act of God or to some result from any other avoidable cause, the penalty provided for shall not apply." In that event the contract is merely to remain suspended during the time of such disability on the part of the seller to make deliveries. Furthermore, it is provided that the total penalties under the contract shall not exceed 5 per cent of the value of all the shells which it covers "and that no other penalty may be exacted"; except, of course, as rejections may be considered in that class.

INSPECTION

All inspections are to be made by representatives of the purchasing government at the plant where the shells or shell parts are manufactured. In case of disputes over the findings of any of the inspectors, the decision of an umpire or referee appointed in a manner mutually agreed upon by the contract parties is to be taken, the fees of the referee to be paid by the loser of the decision. All penalties are subject to suspension until the referee makes his decision. This referee, which is usually one of the well-known bureaus of inspection and tests, is customarily named directly in the contract.

The above constitutes all of the general terms of a shell contract; but they are considerably enlarged upon by the specifications for the shells themselves, which are attached to and form part of the agreement. After a manufacturer is once well started on production, this is where the rub comes, if any.

When the difficulties incident to preparing for manufacturing operations had been overcome, the initial troubles came with inspection. The first inspectors, particularly those sent over from England, were not only ordnance experts but also military martinets. They insisted upon the most rigid adherence to specifications, were curt in their explanations and comments and inclined to be very suspicious. With some of them the shop superintendents and foremen of the United States and Canada did not get on at all, and there was constant friction. As the need for their services in the regular army work was felt, however, most of

these men were recalled and officers of less experience were sent in their place. These, while equally conscientious, were more fortunate in their manner and less disposed to insist on technicalities. Hence things began to go much more smoothly, and reasonable allowances were made as far as possible. The next stage was a shortage of inspectors to cover the numerous plants which had gone into munitions making. Consequently assistant inspectors taken from the volunteer forces and other sources of competent supply have been engaged more recently; and the new system, while still not wholly adequate, is understood to be giving much better satisfaction.

THE EVOLUTION OF THE "AGENT"

Between the purchasing government and the sub-contractors the primary contractors, or more properly agents, have also stood as a buffer and support. A disposition has been manifest to assist both intending and actual manufacturers of shells in every possible way. Financial assistance in plant erection and equipment, advice on the selection and layout of tools, substantial aid in securing deliveries of apparatus or stock needed and help of other kinds have been freely offered.

Originally, at least, these principals made use of special representatives and agents in various centers of metal-working; and some freelances appear to have been authorized directly by the governments of the belligerent nations to ask for tenders in their behalf. The result was the springing up of so-called "agents" in every part of the country where shops abound, and they injected an element of irresponsibility into the situation which caused not a little confusion. The only safe way of approaching the munitions question, therefore, is to apply directly to one of the several recognized purchasing agents in this country of the European powers, all of whom have been repeatedly mentioned in THE IRON AGE, and inquire what contracts are available at the time. These are not as numerous as they were, on account of the vast quantities of supplies already contracted for, for two years ahead; but any concern having the proper facilities and responsibility will undoubtedly be able to get a share of the business in case it decides to take it up.

At Gogebic and Cuyuna Range Iron Mines

Lake Superior Mining Institute's Annual Meeting—Contests in First Aid—Hydraulic Removal of Overburden

The twentieth annual meeting of the Lake Superior Mining Institute of Overburden was held on the Gogebic iron range in Michigan, the Cuyuna range in Minnesota and in Minneapolis on Sept. 6, 7, 8 and 9. The attendance was about the average for these meetings and it required nineteen cars to transport the members and their guests from Ironwood, Mich., to Minneapolis. The party assembled in Ironwood, on the Gogebic range, on Monday morning for the second annual first-aid meet and the afternoon was spent in inspecting some of the properties on the range.

Fourteen teams entered in the first-aid meet, which was in charge of Ed. Higgins, engineer for the Bureau of Mines in the Lake Superior district, and a committee of Gogebic range mining men. Dr. A. F. Knoefel, president of the American Mine Safety Association, was the chief judge, and was assisted by six physicians who came from points south of Chicago. Four difficult problems were given the teams to perform, the exhibition lasting almost two hours. The Verona Iron Company's team from the Menominee range captured the first prize. Second place was awarded to the Oliver Iron Mining Company's Mesaba range team, while the Odanah Iron Company's team from the Gogebic range finished third. Other teams participating were as follows: Montreal Mining Company, Gogebic range; Judson Iron Company, Menominee range; Newport Mining Company, Gogebic range; Colby Iron Company, Gogebic range; Castile Mining Company, Gogebic range; Oliver Iron Mining Company, Gogebic range; Republic Iron & Steel Company, Mesaba range; Republic Iron & Steel Company, Marquette range; Cleveland-Cliffs Iron Company, Marquette range.

THE LARGEST UNDERGROUND MINE

Shortly after noon on Monday the party left in automobiles for a trip over the eastern part of the Gogebic range. The first property visited was the Newport, belonging to the Newport Mining Company. This is the largest underground mine in the Lake Superior district and can ship 1,000,000 tons of iron ore a year without working the mine to capacity. It is finely equipped with the most modern machinery and the mining costs are very low. A new shaft, to be known as the Woodbury, is now being sunk. Work was started in March and already a depth of about 1200 ft. has been reached. In one month it was sunk 206 ft. The shaft is 14 by 24 ft. and will have five compartments. It will be put down 2400 ft. and will replace the present Newport shaft, which is not in any too good shape for the work required of it.

The next stop was at the Anvil mine of the Newport company, which is also a large underground property, with 15,000,000 tons of ore already developed. Without doubt the surface equipment at this mine is the finest in the iron country and the mining men were greatly interested in inspecting the plant. The Palms mine adjoining is another Newport property which has a new shaft and an equipment quite similar to that at the Anvil. The boiler plant at the Anvil consists of three Edgemoor 450-hp. three-pass boilers, equipped with Foster superheaters, which superheat the steam to 100 deg. Fahr. Firing is done by Roney stokers, fed from overhead bins. Coal is stocked in a coal dock and drawn through a tunnel running the entire length of the dock. By slides in the roof of the tunnel, the coal is fed to the conveyor which carries it to a single-roll crusher, from which a belt conveyor takes it to the coal bunkers. In the belt conveyor is installed a Merrick weightometer, which records the total weight of coal hoisted to the bunkers.

The Anvil power house contains a Laidlaw-Dunn-Gordon cross compound two-stage compressor. This machine has a capacity of 3000 cu. ft. of air per minute to 90 lb. per square inch. With it is a Westinghouse Leblanc jet condenser, working at 27 in. vacuum. A cross compound Allis-Chalmers engine, 14 and 28 in. by 36 in. is direct connected to a 300 kw., 250 volt d.c. Allis-Chalmers generator, and working with this engine is a turbine-driven Westinghouse Leblanc jet condenser. The hoist is a twin tandem compound reversible Nordberg, having 10 ft. drum, with 66-in. face. The clutch, reverse, throttle and brake are all operated by oil, pressure being supplied by a small triplex pump and accumulator. It is provided with a safety overwinding device. Condensing is accomplished by a counter current jet condenser and air pump, water being cooled in a natural draft cooling

tower. A gravity oil system with filter lubricates all of the units in the power house.

The next mine inspected was the Wakefield, at Wakefield, Mich., the new pit mine of M. A. Hanna & Co., and the largest pit in Michigan. The first ore was shipped last season and the shipments this year will total 625,000 tons. About 5000 tons is being forwarded to the docks daily, three shovels and five locomotives being kept busy day and night. To the east of the pit are two shafts that are being used for exploratory purposes and to take care of the pit water. The draining is done by churn drill holes, the water going to the shafts and being then pumped to surface. The ore body is quite extensive and the mine will be a shipper for a long term of years. After looking over the Wakefield a short stop was made to inspect the new permanent wooden stocking trestle.

ON THE CUYUNA RANGE

The special trains left Ironwood Monday night after the business session for Crosby on the Cuyuna range. The Cuyuna is the newest of the Lake Superior iron ranges, shipping its first ore only four years ago. At the present time there are quite a few operating mines in the district, with a large number being developed. Much of the ore contains considerable sand and has to be washed or concentrated. There are already several washing plants on the range and more are to be constructed. Crosby is a new town, established three years ago by George Crosby of Duluth, and is growing rapidly. It has fine streets, light, water and sewer systems, and occupies a level stretch on the shores of Serpent Lake. The mines that were visited were the Pennington, Thompson, Armour, Croft, Hill-Crest, Kennedy and Rowe. The Pennington, Thompson, Rowe, Hill-Crest and Armour are open-pit mines. All are shippers, with the exception of the Hill-Crest. At the last-named property the mining men had an opportunity to witness the removal of overburden by the hydraulic method, which was first tried out successfully at the Rowe. It is claimed that dirt can be removed for about 6c. per cubic yard, which is about half the cost of shovel work. The overburden must be sand, with few boulders and rock, in order to get the best results, but the conditions at the Rowe and Hill-Crest were ideal for that work. The Rowe has developed about 1,000,000 tons of iron ore, practically all of which will have to be concentrated. A mill has been erected and is now in operation, but the results are not quite satisfactory to the management and an addition is to be built.

After the morning had been spent in looking over the mines, the Pittsburgh Steel Ore Company, operator of the Rowe, served luncheon to the guests at its beautiful clubhouse, which stands on a hill overlooking the pit. In the afternoon the party returned to Crosby, where a business session was held. That evening the citizens of the village entertained the visitors with a barbecue at the farm of George Crosby. Speeches were made by Mr. Crosby, a State official and several of the members of the institute.

Late Tuesday night the trains departed for Minneapolis, where the party was met at the station the following morning by members of the Minneapolis Civic and Commercial Club and taken for an automobile trip to various points of interest in the city. A stop was made at the University of Minnesota to look over the new mining engineering building, which is soon to be opened to students. Luncheon was served at the Minikahnda Golf Club, after which most of the party paid a visit to the State Fair, which is the largest and most interesting of the State fairs held in the country. There was no program for Thursday, the last day of the meeting, the members being privileged to select their own form of entertainment.

The new president of the institute is Charles E. Lawrence, Palatka, Mich., general manager of the mines of Pickands, Mather & Co., on the Menominee range. The next meeting will take place on that range. There is already some talk of making a trip to Birmingham, Ala., next year, but nothing will be decided for some months. A. J. Yungbluth, Ishpeming, Mich., was re-elected secretary, and E. W. Hopkins, Commonwealth, Wis., was again chosen treasurer.

American Locomotive Company's Report

The fourteenth annual report of the American Locomotive Company, covering the fiscal year ended June 30, 1915, states that at no time in its history had the company suffered such a severe depression in its business. The falling off from the previous year was staggering, as shown by the following comparison of the income account, which includes the Canadian subsidiary:

	1915	1914
Gross earnings	$9,303,298.23	$29,987,438.25
Expenses and depreciation	10,445,900.13	27,425,186.65
Deficit on operations	$1,142,601.90	*$2,562,251.60
Interest	349,378.53	486,124.15
Total deficit	$1,491,980.43	*$2,076,127.45

*Net balance.

The general balance sheet, as of June 30, 1915, compared with that of a year before, shows an increase in cash from $8,411,467 to $15,409,479; a reduction in bonded debt and notes outstanding from $7,729,000 to $5,598,000; an increase in accounts payable from $1,022,135 to $14,156,917, and a reduction in the profit and loss surplus from $11,535,658 to $8,293,677.

From the accompanying remarks by Sylvanus L. Schoonmaker, chairman of the board, the following extracts are taken:

The gross earnings for the year were insufficient to meet the manufacturing, administrative and other expenditures incurred in operations, which resulted in a deficit for the year of $451,296, in addition to which there was charged off for depreciation on property of all kinds the sum of $1,040,683, making a total loss for the year of $1,491,980. The 7 per cent dividend on the preferred stock, amounting to $1,750,000, was paid out of the surplus profits accumulated from the earnings of previous years.

The gross earnings of $9,303,298 for the year 1914-1915 were only about 17 per cent of the gross earnings of $54,868,175 for the year 1912-1913 and were less than half the gross earnings of $19,088,634 for the year 1908-1909, which as a result of the financial panic of 1907 was the worst previous showing in the company's history.

The outbreak of the European war at the beginning of August, 1914, made a continued depression in the company's business more than probable. Accordingly the curtailment in salary forces carried out in the previous years was supplemented by a further retrenchment in expenses. This included a reduction in salaries of all the executive officers and salaried employees. In addition, work on the few orders that were received was concentrated at the Schenectady works, so that the other plants could be closed and the manufacturing expenses cut down. The Schenectady and Cooke plants, operating at a low percentage of capacity, were the only plants out of the eight owned by the company which were not closed either entirely or for a large part of the year. The productive operations of the company as a whole averaged for the year about 17 per cent of capacity and at times ran as low as 8 per cent of capacity.

The income derived from the employment of idle cash, together with interest and dividends on other securities owned, amounted to $452,811, which was more than sufficient to pay the $349,378 of interest on all outstanding bonds and notes.

During the first nine months of the year there was only a small amount of new business booked. Since April, however, the company has secured large foreign orders for delivery during the fiscal year 1915-1916. In addition to these the company had $5,838,235 of locomotive orders on the books June 30, 1915, as compared with $4,162,356 on June 30, 1914. In view of the new foreign business on the books and the prospect of an increase in the demand for locomotives which the company is amply prepared to take care of, the outlook for the coming year is promising.

Of the two furnaces of the Bethlehem Steel Company at South Bethlehem, Pa., which were blown in last month, furnace A was blown in on Aug. 14 and furnace C on Aug. 29.

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The Government and Business Morals

In the recent purchase of 5000 tons of rails for the Alaskan Government Railway from a Western mill the Government profited by a cut in railroad rates that is a luminous example of the varying standards of morals possible where Government activity in business chiefly flourishes. The Government has special land grant freight rates which date back to the original grants of land made to various roads. It therefore asked for prices f.o.b. mill on these rails for Alaska, so that it could make its own freight arrangements. Mill A, from which the regular rate to Seattle is $9 a ton, quoted $30 at mill for open-hearth rails. Mill B, which has a regular rate of $11 to Seattle, also quoted $30 at mill. The land grant rate from mill A is $6.17 to Seattle, and the land grant rate from mill B is $5.777. But when the rail bids were opened the railroad connecting with mill A sent in a secret freight bid to the Government, cutting the special land grant rate from $6.17 to $5. Mill A thereupon received the order. The railroad leading from mill B, holding to the agreement among the railroads that they will not name the Government anything lower than land grant rates, quoted $5.777 and lost the business.

Technically there was nothing illegal in the $5 secret rate, as rates quoted to the Government are not required to be published as are regular rates. But the spectacle of a Government receiving secret concessions with one hand while it stretches out the other to punish the railroad or the individual guilty of the slightest deviation from published rates is its own comment on the elasticity of Government standards of business. Another example was furnished last year when the Navy Department, after receiving bids on certain protective ship plates, rejected all of them so that a high bidder, with competitors' figures before him, might be able to make still lower figures in his second bid and take the business. And this is the day in which Government is defining for business the path of rectitude as it has never been defined before.

In the Alaska rail case the freight rate secured by the Government had no regard to the rates other shippers pay and apparently as little regard for the basis on which a dividend could be paid to the stockholders of the carrier. Turning the case around, it is instructive on what owners of floating property might expect under Government operation of merchant vessels. When Government encouragement is given to competitive methods that would leave investors without dividends, is there any doubt as to what political rate makers would do to keep Government vessels supplied with cargoes, no matter what happened to the vessels of private owners?

Need of a Tariff Commission

The Chamber of Commerce of the United States is about to appoint a special committee on a permanent tariff commission whose function it shall be to prepare data to lay before Congress and to enlighten the business men of the country concerning the desirability of the proposed innovation. Organizations affiliated with the Chamber have been asked to appoint committees to co-operate in this work, the object being to secure a full consensus of opinion from business men of all sections for presentation to the House and Senate as early as possible.

Under the plan for a permanent tariff commission as formulated by the Chamber of Commerce it is provided that the appointment of the commission shall be vested in the President, with the advice and consent of the Senate, that the number of commissioners shall be limited, preferably not more than five, of whom not more than three shall be members of any one political party, that the terms of the commissioners shall be sufficiently long to give the board stability and permanence, preferably six years, and that the terms of individual members shall expire in rotation as in the Interstate Commerce Commission.

It is proposed to authorize the commission to "gather, investigate, and tabulate technical and statistical facts of all kinds pertinent to the tariff schedules, both in this and other countries," and to provide that the reports of the commission shall be confined to ascertained facts and exclude recommendations unless called for by the body having power to institute tariff legislation. The information secured by the commission is to be made available to either house of Congress and to the President. It will be noted that the powers of the commission are limited and are much less comprehensive than those provided in several bills heretofore introduced in Congress.

The Chamber of Commerce has numerous letters of indorsement of this tariff commission plan from prominent members of the Senate. Senator Henry

Cabot Lodge of Massachusetts declares that he has voted again and again in favor of such a permanent body and will be glad to support such a bill as that proposed. Senator Works of California goes further than the Chamber and insists that a tariff commission should be appointed with authority "to formulate and propose to Congress in the form of bills or amendments any legislation that it believes should be enacted so that it might appear in Congress in concrete and definite form." Senator Kenyon of Iowa approves the tariff commission idea on the ground that "we ought to have such a commission in order to get this vital question of the tariff out of the reach of politics."

Senator Poindexter of Washington declares that while a tariff commission is greatly needed he does not believe that, unless it were clothed with administrative powers, it would come any nearer to meeting the needs of the situation in the domain of the tariff than an interstate commerce commission without power to fix railroad rates would in the field of railroad regulation, and adds:

> The imperative economic need of such an administrative system is demonstrated by the fact that circumstances and conditions of trade and manufacture are in a state of constant flux, so that a set of tariff schedules in a state of fixed rigidity are wholly inadequate to meet the just needs and necessities of these fluid and fluctuating conditions with justice either to the country or to the special interests involved. Every other government by which tariff duties are levied, and especially those which levy them under a policy of protection of domestic industries, has certain executive functions or administrative agencies by which special tariff rates can be adjusted to meet the necessities of the occasion. The question that such a plan would be unconstitutional as a delegation of legislative powers is a question by itself, and yet seems so unsound as to require no answer. It certainly would not be any more of a delegation of legislative powers than is the present plan and jurisdiction of the Interstate Commerce Commission. I am for a tariff commission, with or without the powers which I have mentioned, because I am so satisfied that, once established, the needs of such administrative power will become evident that I am rejoiced at any prospect of the creation of a commission at all.

While it must be admitted that the experience of this country with commissions has not been wholly satisfactory, the sentiment in favor of a tariff commission has been persistently growing. The need of more frequent revisions of tariff rates than are now possible under Congressional modes of procedure is recognized. So cumbrous are these methods and so long drawn out are the proceedings in making a revision that business interests dread the taking up of the tariff question by Congress, knowing that it means months of uncertainty and of interference with the orderly progress of trade. Hence, revised tariff schedules that have been adopted by Congress and enacted into law may remain untouched for years, although rates on some articles prove to be too low or too high, simply because piecemeal revision is repugnant to the Congressional view of the proper method of handling tariff matters. Apart from the highly important and desirable accomplishment of placing the tariff out of the reach of politics, the appointment of a tariff commission with power to make changes from time to time as the need may develop would be a valuable adjunct to our system of government.

Finished and Unfinished Steel Prices

Remarkable divergences have ruled lately between prices of unfinished and of finished steel respectively, divergences that are to be attributed to the fact that in times of pressure the steel mills endeavor to take care of their regular trade in finished products despite the fact that greater profits per ton could be realized by selling unfinished steel. Thus bids of $26 at maker's mill for basic open-hearth steel billets have not brought out as much tonnage as could have been sold, yet mills which refused such bids were ready to sell bars, plates and shapes at 1.35c., or $27 a net ton, and were filling old orders which in some cases gave them no more than $24 a net ton. The steel trade has its ethics, and one of its principles is to take care of the manufacturing consumers of its finished products. Another principle, so generally recognized that its observance attracts no attention, is to make deliveries in rotation, not giving an undeserved priority to the customer who pays the highest price. This principle is not observed in all trades, and lapses are not unknown in respect to steel, but if a steel mill were found to be making deliveries of bars at 1.35c. and causing inconvenience to buyers holding contracts at 1.20c., through slow deliveries, its case would at once become very conspicuous.

Of course the steel mills have obligations to consumers of billets, sheet bars and rods, but these obligations are always put in the form of definite contracts, and the odd lots which sell in the market at fancy prices have no relation to these contracts.

In the case of rods, the wire mills regard the market as from $30 to $31. It is quite probable that a tonnage could be sold at higher figures, but mills that quote "the market" at $30 to $31 generally state at the same time that they have no rods to sell. They make no effort to secure the higher prices that might be obtained for rods, because the higher price would be unreasonable, seeing that base sizes of drawn wire are being held at $30 per net ton or $33.60 per gross ton.

The billet market has been bid up by consumers whose wants are so irregular that they have not provided themselves with contracts insuring them an adequate supply at this time. As a rule, they are making specialties for which prices are obtained justifying the paying of a high price for billets. Billets bought at fancy prices are not being converted into the staple finished steel products that sell at regular prices.

The position of sheet bars constitutes an anomaly in the market. If billets can be sold at $26, sheet bars should bring $26.50 or $27, as they cost somewhat more to make, and as a rule the mill that can make sheet bars can also make billets. On the other hand, there are mills in position to make billets but not sheet bars and hence, as markets go, if there is a scarcity the sheet bars should be commanding the higher figure. As a matter of fact, however, it would be quite impossible to sell a round tonnage of sheet bars at a price even several dollars a ton below the price that is freely offered for billets.

The sheet market, in other words, has not responded to the advance in unfinished steel. The market for No. 28 gage black sheets has lately

been 1.90c., or $38 a net ton, and it is generally understood that the bare factory cost of converting a gross ton of sheet bars into a net ton of 28 gage sheets is not less than $15, which would put the sheet bars at not over $23, delivered to the sheet mill. If the mill obtaining steel on contract were permitted to resell—which it is not—it would be able to make a profit beyond the overhead expenses of an idle sheet mill by taking billets on its contract instead of sheet bars and selling the billets in the open market. As it is, there are probably many sheet mills not earning their overhead at this time. The sheet market has usually been somewhat slow in responding to advances in the unfinished steel market. At this juncture it has been particularly slow, probably because there is idle capacity due to the stagnation in the galvanized sheet trade, this being caused partly by the very high price of spelter and partly by the rapid fluctuations in the spelter market. For months spelter has been either advancing sharply or declining sharply. At the one time the producer is afraid to sell, while at the other time the buyer is afraid to buy.

Growing Trade with South America

Exports from the United States to South America are growing decidedly. For June, 1915, they were valued at $13,744,000, against $7,573,000 in June, 1914, an increase of over 45 per cent. For the first six months of 1915 they were $60,573,000, against $52,263,000 in the first half of 1914 and $38,751,000 in the last half of 1914.

Imports are also on the increase. For June they were $26,210,000, as compared with $17,118,000 in June, 1914. For the six months ended with June, this year, the total imports were $156,043,000, against $144,074,000 to July 1, 1914, and $105,447,000 for the last half of 1914.

The total exports from New York to South American countries for the four weeks ending Aug. 28, as tabulated by the Foreign Trade Department in the National City Bank of New York, were valued at $8,252,788, as against $4,802,285 for the corresponding four weeks in 1914. For Argentina the figures are $3,102,472, against $957,730. July and August shipments of nitrates from Chile have been more than double those of the corresponding months of last year. These shipments are moving to Europe as well as to the United States. The importations of nitrate of soda into the United States in June, the latest available figures, were 93,076 tons, valued at $3,117,765, against 57,411 tons valued at $1,640,067 in June of last year, and it is probable that the July and August figures will show an equal or greater advance.

Consular Regulations of Latin America

American exporters who have attempted to ship their goods to Latin-American markets without the assistance of a commission house or customs broker fully appreciate the difficulties involved in preparing the shipping documents. The customs regulations of Latin-American countries are very detailed as to the information to be included in such documents, and a fine is provided for every possible deviation from the prescribed rules.

From the numerous complaints that have reached the Bureau of Foreign and Domestic Commerce, of the Department of Commerce, it was concluded that American exporters needed a sort of guide book to help them in preparing shipping documents for Latin-American countries, and a publication entitled "Consular Regulations of Foreign Countries (Canada and Latin America)," Tariff Series No. 24, has just been issued by that Bureau and may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 10 cents a copy. The 66-page pamphlet contains a complete description of the shipping documents required in all Latin-American countries and Canada, gives fac similes of consular invoices used in such countries, and points out such peculiar features as may be overlooked by the average exporter.

National Foreign Trade Council

The National Foreign Trade Council, of which Robert H. Patchin is secretary with headquarters at 64 Stone Street, New York, will hold its annual meeting at the Biltmore, New York, on Thursday, Sept. 23. President Farrell of the Steel Corporation is chairman of the council. It will be decided at the annual meeting when and where the third National Foreign Trade Convention will be held. The first was at Washington in 1914 and the second at St. Louis, Jan. 21 and 22, 1915. New Orleans has asked for the next convention, but there is a strong leaning toward Washington on the part of some members of the council.

Chairman Farrell in his call for the meeting said: "It is perhaps superfluous to say that although American export trade during the last fiscal year was larger than ever before, its volume was due to abnormal conditions. Export of the articles required in peace was greatly decreased. Elimination of European competition as a result of war has favored our export trade, but we may expect renewed and strengthened competition with the advent of peace. To anticipate these developments and carefully to consider measures necessary to meet them is the duty of the council. Its several committees have been investigating and in some instances acting upon the questions arising in our oversea commerce and their reports will be rendered at the forthcoming meeting."

International Trade Conference in New York

Under the auspices of the foreign trade department of the National Association of Manufacturers an International Trade Conference will be held at the Hotel Astor, New York, Dec. 6, 7 and 8. It is stated in the announcement made by the association that the conference will be made of special interest and practical benefit to the manufacturers of the country. Among those who will attend are prominent bankers as well as representatives of transportation interests, both inland and ocean. Prominent business men from foreign countries will be invited.

The highest bid received by Julius J. Goetz, trustee of the bankrupt Prime Steel Company, Milwaukee, Wis., for the assets offered for sale Sept. 8 was $21,250, offered by Charles H. Winternitz, Chicago, Ill. At a meeting of creditors on the following day the decision was made that the price was not satisfactory and the referee refused to confirm the sale. The court then set Sept. 20 for a resale of the assets, and if the price received at that time is not considered satisfactory the trustee will be directed to dispose of them at private sale. The assets consist of two plants, known as the Dutcher works and the Crucible plant, together with machinery, flasks, scrap, office furniture, etc.

Brazil's balance of trade in exports and imports for the first three months of 1915 was in the country's favor by $39,019,350 against only $17,082,518 in the first quarter of 1914, an increase of over 100 per cent. Imports for this period this year dropped more than 50 per cent, or from $59,972,695 to April 1, 1914, to $28,246,044 to April 1, 1915. The decrease in imports from the United States is only 13 per cent, the showing being exceeded only by Holland, British India and Mexico.

According to reports from Skagway, Alaska, shipments are being made from large deposits of magnesite in that locality as a result of the European war.

SPELTER PRODUCTION IN 1915

Statistics of Output in this Country in the First Half of the Year

Figures compiled by C. E. Siebenthal of the United States Geological Survey from reports by all zinc smelters operating in the first six months of 1915 show that the production of spelter from domestic ore in that period was 207,634 net tons and from foreign ore 8898 tons, a total production of 216,532 tons, compared with 177,991 tons for the last half of 1914 and 175,058 tons for the first half. The stock of spelter held at smelters on June 30, 1915, was 5884 tons, against 20,095 tons at the beginning of the year and 64,039 tons at the middle of 1914.

In addition to the spelter produced from ore, 13,546 tons of spelter was made from skimmings, drosses, etc., by distilling. No statistics were obtained of the spelter produced by remelting skimmings, drosses, etc., but it was probably not less than 12,000 tons. The total output of spelter from both ore and skimmings was therefore about 242,000 tons, or at the rate of 484,000 tons per year.

The imports of spelter were 489 net tons, compared with 374 tons during the last half of 1914 and 506 tons during the first half. The exports of spelter of domestic origin were 64,368 tons, against 63,983 tons in the last half of 1914 and 824 tons in the first half. The exports of spelter of foreign origin, including spelter exported from bonded warehouse, as well as articles manufactured from spelter of foreign origin and exported with benefit of drawback, were 5958 tons, compared with 8513 tons in the last half of 1914 and 2048 tons in the first half.

The imports of zinc ore were 66,683 net tons, containing 23,997 tons of zinc, compared with 22,910 tons of ore, containing 9183 tons of zinc, in the last half of 1914, and 9052 tons of ore, containing 2949 tons of zinc, in the first half. Of the imports of zinc in ore in 1915 about three-fourths came from Canada. The exports of domestic zinc ore were 678 tons, compared with 3069 tons in the last half of 1914 and 8042 tons in the first half.

There was much activity in smelter building during the first half of the year, with further increases under construction or planned for the immediate future. The total number of retorts was 113,914 at the close of 1914 and 130,642 at the close of June, 1915, an increase of 16,728 retorts, or 15 per cent, over the smelting capacity in 1913. The whole number of retorts in operation in June was about 129,000. Since June 30, 34,048 retorts have been completed or are under construction or in contemplation. If all these are constructed, the zinc-smelting capacity of the country will be increased nearly 50 per cent over 1914. These figures differ somewhat from those given in the preliminary midyear report owing to the inclusion of later information. It seems likely, however, in view of the recent decline in spelter prices and the large increase in capacity already available, that some of the contemplated additions will not be made.

In 1908 the Survey instituted an inquiry to determine the smelting capacity per retort. The result of this inquiry gave 4¼ net tons of spelter as the maximum annual output per retort with steady operation.

The new plant of the Minnesota Steel Company at Duluth is expected to be making steel by Nov. 1. There has been an intimation that billets would be rolled for shipment to the Chicago district mills of the Steel Corporation, but it now seems likely that the mill at Duluth will start on large rounds for export, making the fifth plant of the Steel Corporation at which such bars are being rolled.

The Wilson Foundry & Machine Company, Pontiac, Mich., has given an order to the H. M. Lane Company, Detroit, Mich., for thirty-eight core ovens. Thirty of these are of the new type designed by H. M. Lane.

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Better Locomotive Buying

The railroads are showing more interest in locomotive buying. Prominent inquiries are for 30 Mallet type for the Norfolk & Western and 50 Mikado type for the Illinois Central. Orders actually placed recently exceed 95. The Chicago & North Western has ordered 45 of various types from the American Locomotive Company, while the Chicago, St. Paul, Minneapolis & Omaha has ordered 10 and the Madrid, Saragossa & Alicante Railway of Spain 25 from the same company. The Baldwin Locomotive Works has received an order for 13 from the Texas & Pacific and for 6 from the Utah Copper Company. The American Locomotive Company will also build 3 locomotives for the American Railroad Company of Porto Rico. The Atchison, Topeka & Santa Fe is expected to enter the market for additional locomotives.

Statistical Bureau Goes to New York

Announcement is made that about Oct. 1 the Statistical Bureau of the American Iron and Steel Institute, which has been in charge of William G. Gray at 261 South Fourth Street, Philadelphia, since this work was taken over by the institute after the death of James M. Swank, will be removed to the main offices of the institute at 61 Broadway, New York.

The Iron and Metal Markets

STEEL FOR RAILROADS

The Question of Deliveries Now Up

Basic Pig Iron Sales in the East—Chicago Merchant Furnaces Advance Prices

With steel-making capacity so largely taken up for 1915 the trade is daily making calculations for the early months of 1916. There is more evidence that the hand of the railroads is being forced by the size of the foreign inquiry for steel to be shipped after Jan. 1. It looks now as though the railroads will all at once want a good many cars and locomotives and that they will have to take their turn after buyers who have been more forehanded.

Locomotive orders and inquiries have been larger in the past week than in months. Some car requirements are shaping up. In the case of the New York Central both rails and cars are up and rails for fall and winter delivery are expected to be placed at Buffalo. The Seaboard Air Line has ordered 7000 tons of rails and the Clover Leaf 3000 tons. Generally Western roads have not begun to negotiate for next year's rails.

In war billets, blooms and large rounds, active inquiry now before the steel companies for the first quarter of 1916 covers about 200,000 tons. A recent sale of billets of 0.45 to 0.55 per cent carbon for shell forgings was at $40 at Ohio mill.

For work already under contract a few sales of plates, shapes and bars have been made for the first half of 1916 at 1.40c., Pittsburgh. For this year 1.35c. is the market on shapes and bars, though on steel bars deliveries this year are more difficult, while plates are still to be had at 1.30c., Pittsburgh. In contrast with what was the rule for many months, Eastern plate mills are getting a higher Pittsburgh price than those of the Central West.

Tin plate mills find some falling off in demand, the packers' season thus far having been under expectations. Some mills now have but two or three weeks' orders ahead and there has been a slowing down of operations in western Pennsylvania.

Improvement in the sheet trade has been mainly due to automobile demand. On blue annealed sheets the advance has been from $1 to $2 a ton.

The report that fabricating orders in August reached 85 per cent of the country's capacity was a surprise. For the past six months the average has been 73 per cent, while in the last big year, 1912, it was probably not over 70 per cent. Chiefly interesting in new work is 25,000 tons of elevated road for Philadelphia. At Youngstown 3600 tons of new steel work construction has been awarded and altogether steel-works additions are a larger factor in the structural trade than in months.

An advance of $2 to $3 in light rails brings 25 to 45-lb. rails to a parity with standard sections at $28 a ton. Bar iron is also higher, Chicago mills having little to sell at 1.25c. while Eastern mills are now asking 1.35c. Pittsburgh.

The scarcity of wire rods is more marked even at $30 Pittsburgh, and the wire situation is still largely dominated by export operations.

On purchases of 45,500 tons of basic pig iron by an Eastern steel company for delivery in the first quarter of 1916 the buyer paid $17, delivered, for 10,000 tons and $17.25 for the greater part of the remainder, which was below the price some sellers had announced for next year. The possibility of bringing in Central Western iron was a factor.

An inquiry for over 32,000 tons of pig iron for next year has come from the General Electric Company. As a rule Central Western foundries are not buying for next year and are disposed to contest the advances the furnaces have made lately. Several additional furnaces have been blown in this month and a few others are preparing to resume.

Chicago merchant furnaces have at last advanced their prices, which have been kept out of line with those of other Northern districts by the effort to get business Southern furnaces have had heretofore.

Coke, the last of the raw materials to respond to the prosperity in finished steel, is advancing under extensive negotiations for next year. A considerable tonnage has been covered for the first half at $2 at ovens and at $1.65 the spot price is up 10 to 15 cents. Producers would base new sliding-scale contracts on $2 when basic pig iron is $14, with the coke price going up or down by one-sixth of any change in basic iron. Old contracts were at $1.75 with basic iron at $13.

The large contract shipments of Lake Superior ore, the additional sales lately made, the larger consumption expected east of the Alleghenies, and the considerable advance already scored in pig-iron prices—all are being urged as reasons for an advance in Lake ore prices for next year.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics

At date, one week, one month and one year previous	Sept. 15, 1915.	Sept. 8, 1915.	Aug. 18, 1915.	Sept. 16, 1914.
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia...	$16.00	$16.00	$15.00	$14.75
No. 2, Valley furnace....	14.50	14.50	13.25	13.00
No. 2 Southern, Cin'ti....	**14.15**	13.90	13.90	13.25
No. 2, Birmingham, Ala..	**11.25**	11.00	11.00	10.00
No. 2, furnace, Chicago*	**14.00**	13.50	13.50	13.25
Basic, del'd, eastern Pa..	17.00	17.00	15.50	14.00
Basic, Valley furnace....	**14.75**	14.50	14.25	13.00
Bessemer, Pittsburgh....	16.95	16.95	16.20	14.90
Malleable Bess., Ch'go*.	**14.50**	13.50	13.50	13.25
Gray forge, Pittsburgh..	14.70	14.70	14.20	13.65
L. S. charcoal, Chicago..	15.75	15.75	16.25	15.75
Billets, etc. Per Gross Ton:				
Bess. billets, Pittsburgh.	24.00	24.00	23.50	21.00
O.-h. billets, Pittsburgh..	24.50	24.50	24.00	21.00
O.-h. sheet bars, P'gh...	**25.50**	25.00	24.50	22.00
Forging billets, base, P'gh	32.00	32.00	29.00	26.00
O.-h. billets, Phila.....	*30.00*	32.00	30.00	23.40
Wire rods, Pittsburgh...	**30.00**	29.00	27.00	26.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia..	1.459	1.459	1.459	1.12
Iron bars, Pittsburgh....	1.35	1.35	1.30	1.20
Iron bars, Chicago.....	1.25	1.25	1.25	1.07½
Steel bars, Pittsburgh...	1.35	1.35	1.30	1.20
Steel bars, New York....	1.519	1.519	1.469	1.36
Tank plates, Pittsburgh..	1.35	1.35	1.25	1.20
Tank plates, New York.	1.519	1.519	1.469	1.36
Beams, etc., Pittsburgh..	1.35	1.35	1.30	1.20
Beams, etc., New York...	1.519	1.519	1.469	1.36
Skelp, grooved steel, P'gh	1.30	1.30	1.25	1.20
Skelp, sheared steel, P'gh	1.35	1.35	1.30	1.25
Steel hoops, Pittsburgh..	1.35	1.35	1.30	1.30

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	Sept. 15, 1915.	Sept. 8, 1915.	Aug. 18, 1915.	Sept. 16, 1914.
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	1.90	1.90	1.85	1.95
Galv. sheets, No. 28, P'gh	3.60	3.60	3.60	2.95
Wire nails, Pittsburgh	1.65	1.65	1.60	1.60
Cut nails, Pittsburgh	1.60	1.60	1.60	1.60
Fence wire, base, P'gh	1.50	1.50	1.40	1.40
Barb wire, galv., P'gh	2.50	2.50	2.50	2.00
Old Material, Per Gross Ton:				
Iron rails, Chicago	$13.50	$13.50	$12.25	$12.00
Iron rails, Philadelphia	18.50	18.50	16.00	14.00
Carwheels, Chicago	11.75	11.75	11.75	11.00
Carwheels, Philadelphia	14.00	14.00	13.50	11.00
Heavy steel scrap, P'gh	14.50	14.50	14.00	11.25
Heavy steel scrap, Phila.	15.00	15.00	14.00	10.75
Heavy steel scrap, Ch'go	11.75	11.75	11.75	9.00
No. 1 cast, Pittsburgh	13.00	13.00	13.00	11.50
No. 1 cast, Philadelphia	14.00	14.00	13.50	12.00
No. 1 cast, Ch'go (net ton)	10.00	10.00	9.50	9.00
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	**$1.60**	$1.50	$1.50	$1.65
Furnace coke, future	**2.00**	1.75	1.75	1.75
Foundry coke, prompt	**2.15**	2.00	2.00	2.10
Foundry coke, future	**2.40**	2.25	2.25	2.25
Metals.				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	18.00	18.00	19.00	12.75
Electrolytic copper, N. Y.	**17.75**	17.50	16.75	12.12½
Spelter, St. Louis	*13.75*	14.25	11.50	5.30
Spelter, New York	*14.00*	14.50	11.75	5.45
Lead, St. Louis	*4.35*	4.75	4.35	3.70
Lead, New York	*4.50*	4.90	4.50	3.87½
Tin, New York	**33.37½**	33.25	34.50	31.35
Antimony, Asiatic, N. Y.	*27.50*	28.00	33.50	10.00
Tin plate, 100-lb. box, P'gh	$3.15	$3.15	$3.10	$3.40

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 75c., on plates, structural shapes and sheets and 65c. on wrought pipe and boiler tubes. The foregoing rates to the Pacific coast are by rail. The rate via New York and the Panama Canal is 58.9c.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.35c. base net cash, thirty days. Following are stipulations prescribed by manufacturers:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated Feb. 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gage or weight to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras	Cents per lb.
Gages under ¼ in. to and including 3-16 in.	.10
Gages under 3-16 in. to and including No. 8	.15
Gages under No. 8 to and including No. 9	.25
Gages under No. 9 to and including No. 10	.30
Gages under No. 10 to and including No. 12	.40
Sketches (including straight taper plates), 3 ft. and over	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Wire Products.—Prices to jobbers, in effect from Aug. 23: Fence wire, Nos. 0 to 9, per 100 lb., terms sixty days or 2 per cent discount in ten days, carload lots, annealed, $1.50; galvanized, $2.20. Galvanized barb wire and staples, $2.50; painted, $1.80. Wire nails, $1.65. Galvanized nails, 1 in. and longer, $1.75 advance over base price; shorter than 1 in., $2.25 advance over base price. Woven wire fencing, 70½ per cent off list for carloads, 69½ off for 1000-rod lots; 68½ off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.55	$1.60	$1.65	$1.70	$1.80	$1.90	$2.00	$2.10
Galvanized	2.45	2.50	2.55	2.60	2.70	2.80	3.10	3.20

Wire Rods.—Bessemer, open-hearth and chain rods, $30 to $31.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 1.35c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Handrail tees	.75
Cutting to lengths under 3 ft., to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from Aug. 16, 1915, all full weight:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	72	46½	⅛ and ¼	64	37
½	76	59½	⅜	64	37
¾ to 3	79	63½	½	68	47
			¾ to 2½	71	52

Lap Weld

2	76	60½	1¼	55	36
2½ to 6	78	62½	1½	66	47
7 to 12	76	58½	2	67	49
13 and 14	62½	..	2½ to 4	69	52
15	60	..	4½ to 6	69	52
			7 to 12	67	50

Reamed and Drifted

1 to 3, butt	77	61½	1 to 1½, butt	69	50
2, lap	74	58½	2, butt	69	50
2½ to 6, lap	76	60½	1½, lap	53	34
			1½, lap	64	45
			2, lap	65	47
			2½ to 4, lap	67	50

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	67	49½	⅜	61	43
½	72	58½	½	66	51
¾ to 1½	76	62½	¾ to 1½	70	53
2 to 3	77	63½	2 and 2½	71	54

Lap Weld, extra strong, plain ends

2	73	57½	1½	65	48
2½ to 4	75	59½	2	67	49
4½ to 6	74	58½	2½ to 4	69	52
7 to 8	68	50½	4½ to 6	68	51
9 to 12	63	45½	7 to 8	61	44
			9 to 12	56	39

Butt Weld, double extra strong, plain ends

½	62	48½	½	56	40
¾ to 1½	65	51½	¾ to 1½	59	43
2 to 2½	67	53½	2 and 2½	61	45

Lap Weld, double extra strong, plain ends

2	63	49½	2	57	40
2½ to 4	65	51½	2½ to 4	59	45
4½ to 6	64	50½	4½ to 6	58	44
7 to 8	58	40½	7 to 8	51	33

To the large jobbing trade an additional 5 per cent is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts on less than carloads, f.o.b. Pittsburgh, freight to destination added, in effect from July 16, 1915:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	63	1¾ and 2 in.	50
2¼ in.	60	2¼ in.	47
2½ to 2¾ in.	66	2½ and 2¾ in.	54
3 and 3¼ in.	71	3 and 3¼ in.	58
3½ and 4½ in.	72	3½ and 4½ in.	60
5 and 6 in.	65	5 and 6 in.	54
7 to 13 in.	62		

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gage, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms thirty days net, or 2 per cent cash discount in ten days from date of invoice:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	1.45 to 1.55
Nos. 9 to 10	1.50 to 1.60
Nos. 11 and 12	1.55 to 1.65
Nos. 13 and 14	1.65 to 1.75
Nos. 15 and 16	1.75 to 1.85

Box Annealed Sheets, Cold Rolled

	Cents per lb.
Nos. 10 and 11	1.55
No. 12	1.55
Nos. 13 and 14	1.60
Nos. 15 and 16	1.65
Nos. 17 to 21	1.70
Nos. 22 and 24	1.75
Nos. 25 and 26	1.80
No. 27	1.85
No. 28	1.90
No. 29	1.95
No. 30	2.05

Galvanized Sheets of Black Sheet Gage

	Cents per lb.
Nos. 10 and 11	2.60 to 2.75
No. 12	2.70 to 2.85
Nos. 13 and 14	2.70 to 2.85
Nos. 15 and 16	2.80 to 2.95
Nos. 17 to 21	2.95 to 3.10
Nos. 22 and 24	3.15 to 3.30
Nos. 25 and 26	3.30 to 3.45
No. 27	3.45 to 3.60
No. 28	3.60 to 3.75
No. 29	4.35 to 4.50
No. 30	4.60 to 4.75

Pittsburgh

PITTSBURGH, PA., Sept. 14, 1915.

Nothing of special moment developed in the local steel trade last week, but the situation is strong in every way, particularly in open-hearth steel, for which there is a continued heavy demand. Foreign buyers failing to place orders for rounds are now negotiating for forging billets, ranging from 0.45 to 0.55 carbon, one inquiry being for 40,000 tons. Prices on all open-hearth products are very strong and are almost certain to be higher. Sheet bars for late in the year delivery have sold at $26, maker's mill, Youngstown. Pig iron has been fairly active, and the higher prices are maintained. The railroads are showing more interest in the market and are sending out inquiries to some extent for steel rails, cars and track materials for delivery early in 1916. They find the steel mills well loaded up and more indifferent about taking orders except at prevailing prices. The lull in the scrap trade continues, but prices are ruling fairly strong. Blast furnace coke showed more activity in the past week than at any time for months, some contracts having been closed at $2 per net ton at oven for remainder of the year and into first quarter of next year. The coke makers have decided that they ought to have more money for their product in view of the higher prices of pig iron, and they seem in a fair way to get it. Operations among the mills and other manufacturing plants in the Pittsburgh district are at high tide and are likely thus to continue for some months.

Pig Iron.—Inquiry for basic iron the past week has been fairly active. The United Steel Company, Canton, Ohio, has bought about 10,000 tons of basic for November and December delivery on the basis of about $14.50, Valley furnace, or perhaps slightly higher. A large Eastern consumer is reported to have bought 10,000 tons of basic for delivery in first half of 1916 at close to $15, Western furnace. While sales of basic are reported as high as $15, these are not confirmed, but nearly all sellers are asking that price. The market is all of $14.75, and a sale of 3000 tons for last quarter is given at that figure. While there have been no sales of Bessemer iron of any moment, it is stated that several of the large steel companies will be in the market in the near future for both Bessemer and basic iron. There is a fair demand for foundry iron, but most consumers are covered over the remainder of the year. The furnace of the Sharpsville Furnace Company, which has been idle for some years, is being made ready for blast and will likely go in about Nov. 1. This is a small stack and is expected to turn out about 175 tons of Bessemer iron per day. Prices are very firm. We quote: Standard Bessemer iron, $16; basic, $14.75 to $15; malleable Bessemer, $14.50 to $14.75; gray forge, $13.75 to $14, and No. 2 foundry, $14.75 to $15, all at Valley furnace, the freight for delivery in the Cleveland or Pittsburgh district being 95c. per ton.

Billets and Sheet Bars.—It develops that the export sale of steel referred to in this report last week as having been made by a Youngstown interest was for 50,000 tons of 6 x 6 in. billets of high carbon, and the price is said to have been $40 per ton, or higher, at maker's mill, the specifications being very severe, especially in the discard, which runs 30 to 33 per cent. The deliveries are over the next four or five months. An inquiry is in the market for 40,000 tons of forging billets, 5¾ in. square, and 15 in. long, carbon running 0.45 to 0.55, to be forged into projectiles. The specifications are severe, the discard from the top of the ingot being 30 to 35 per cent and 5 to 10 per cent from the bottom. These billets, if placed, will no doubt command a high price. There is an active demand for both Bessemer and open-hearth billets, but very little inquiry for sheet bars, as consumers are covered on the latter on contracts. There is a good deal of activity in forging billets and prices are higher. We note a sale of 150 tons of forging billets, ordinary carbons, at $32, Pittsburgh, and higher carbons are sold at $36 to $37. We also note a sale of 2000 tons of open-hearth sheet bars for December delivery at $26, maker's mill, Youngstown. We quote Bessemer billets, $24 to $24.50; open-hearth billets, $24.50 to $25; Bessemer sheet bars, $25, and open-hearth sheet bars, $25.50, maker's mill, Youngstown or Pittsburgh, prices of steel at the two points being practically the same. It is predicted that prices on open-hearth steel will be much higher as the scarcity in supply is getting worse. We quote forging billets at $32 to $33 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 and up to 0.60 carbon take $1 per ton extra. Axle billets are held at $29 to $30.

Ferroalloys.—There is considerable demand for ferromanganese in carloads and larger quantities up to 500 tons, indicating that stocks of consumers are getting low. Domestic ferromanganese is still quoted at $110 to $112.50, Pittsburgh, in carloads and larger lots. We note sales of three cars, one at $111, and the other two at $112, delivered Pittsburgh. The advance in the price of Bessemer ferrosilicon is maintained, and we quote this material as follows: 10 per cent, $20; 11 per cent, $21; 12 per cent, $22; 13 per cent, $23, and 14 per cent, $24, all f.o.b. cars at furnace, Ashland, Ky., New Straitsville, Ohio, or Jackson, Ohio, each of these points having a freight rate of $2 per gross ton to Pittsburgh. We quote 20 per cent spiegeleisen at $27 at furnace. We note a sale of 2000 tons of 14 per cent Bessemer ferrosilicon at $25 at furnace, equal monthly deliveries over the first half of 1916. We quote ferrotitanium at 8c. per pound in carloads, 10c. in 2000-lb. lots and over, and 12½c. in smaller lots. We quote ferrovanadium at $2 to $2.25 per pound of contained vanadium, prices depending somewhat on the size of the order.

Steel Rails.—The Carnegie Steel Company and other makers have advanced prices on light rails and are now quoting as follows: 25 to 45 lb. sections, 1.25c.; 16 and 20 lb., 1.30c.; 12 and 14 lb., 1.35c.; 8 and 10 lb., 1.40c. in carloads or larger lots, 5c. advance being charged for less than carload lots. Routine orders for standard section rails are being placed, mostly for this year's delivery, the Carnegie Steel Company having taken two contracts for 1500 tons each and one for 500 tons in the past week. The new demand for light rails is more active, the coal interests buying more freely and in the past week the Carnegie Company received new orders and specifications for about 3500 tons. We quote standard section rails of Bessemer stock at 1.25c., and of open-hearth, 1.34c., f.o.b. Pittsburgh.

Structural Material.—Inquiry has been better and some large jobs have been placed. The McClintic-Marshall Company has taken steel buildings for the Youngstown Sheet & Tube Company, 3000 tons, and a railroad bridge for the same company across the Mahoning River, about 600 tons. The same company has also taken 2500 tons for pier sheds for the Pennsylvania Railroad at Greenville, N. J. The Riter-Conley Mfg. Company has taken 400 tons for a power house and boiler house for the Youngstown Sheet & Tube Company, and the Pittsburgh Bridge & Iron Works a highway approach for the same company, about 100 tons. The Riter-Conley Company has also taken 200 tons for extensions to the plant of the American Vanadium Company, Bridgeville, Pa., and 100 tons for a building for the Western Pennsylvania penitentiary. The American Bridge Company has taken 860 tons for the Willys-Overland Company, and 2600 tons for extensions to the plant of the William Cramp & Sons Ship & Engine Building Company, Philadelphia. Prices are very firm and we quote beams and channels up to 15 in. at 1.35c., f.o.b. Pittsburgh. It is said that shapes have sold for delivery in first quarter of 1916 at 1.40c., Pittsburgh, this price having been made on some specific work.

Plates.—The Government will open bids Nov. 17 on two battleships requiring 13,000 to 14,000 tons of plates and armament, also on 16 submarines, each taking about 250 tons of armament, also two sea-going submarines and six torpedo boat destroyers. The Wheeling & Lake Erie Railroad has an inquiry out for 700 70-ton steel gondola cars, 200 automobile and 100 box cars. The New York Central has asked bids on 1000 box cars instead of miscellaneous cars, as reported last week. The new demand for plates is fairly active and, with contracts placed some time ago, has filled the plate mills up for the remainder of the year, and the large makers are running their mills to 100 per cent capacity, turning out more plates than ever before in their history. We quote ¼-in. and heavier tank plates at 1.35c., f.o.b. Pittsburgh, but a few mills are still naming 1.30c. on desirable orders.

Sheets.—The demand for Bessemer black and blue annealed sheets is heavier than for some time, and prices are quite firm, but galvanized is dull as consumers fear a decline in the market, prices on spelter being very erratic. There is a continued heavy demand for high-grade sheets from the electrical companies. With the exception of galvanized, the whole sheet market is in better shape than for some time. Most mills are quoting on the basis of 3.75c. for No. 28 galvanized, but jobbers are selling from stock at 3.60c. or less. The minimum on blue annealed sheets now seems to be 1.50c., with some mills quoting as high as 1.60c. We quote No. 28 galvanized sheets at 3.60c. to 3.75c.; No. 28 Bessemer black sheets, 1.90c.; Nos. 9 and 10 blue annealed, 1.50c. to 1.60c.; No. 30 black plate, tin-mill sizes, H. R. & A., 1.95c.; No. 28, 1.90c., Nos. 27, 26 and 25, 1.85c.; Nos. 22 and 24, 1.80c.; Nos. 17 to 21, 1.75c.; Nos. 15 and 16, 1.70c. The above prices are for carload lots, f.o.b. at maker's mill, jobbers charging the usual advance for small lots from store.

Tin Plate.—This trade is falling off, the packers having a very backward season and not specifying as freely against contracts as usual. There is a continued export demand and quite large shipments of tin plate are being made to foreign countries, mostly to Asia and South America. The mills are now seeing daylight on specifications, having only two or three weeks' work ahead. Operations are slowing down, the American Sheet & Tin Plate Company running to about 94 per cent, but only operating about five days per week. Several other large tin mills report they are still running full, but will be compelled to take off some trains shortly unless specifications pick up. Prices are firm and we quote 14 x 20 coke plates for domestic trade at $3.15 to $3.25 per base box, f.o.b. Pittsburgh, in small lots. There is very little domestic demand.

Wire Rods.—There is almost a famine in supply of rods and high prices are being paid to secure them. One local mill reports it has sold several small lots of rods as high as $30, and it is stated $32 has been paid for prompt shipment. We quote Bessemer, open-hearth and chain rods at $30 to $31, f.o.b. Pittsburgh.

Wire Products.—The export demand for barb wire is still very heavy, but the mills are compelled to refuse a good deal of the business offered to them, not being able to make the deliveries on account of having their product well sold up for the remainder of this year. Some buyers find they have to pay a slight advance in prices in order to get prompt deliveries. The new demand for wire nails is only fair, and it is stated that the $1.65 price is not observed in all cases. Indications are that the trade in fence wire this fall will be lighter than usual, owing to high prices. All the wire mills in the Pittsburgh district are operating to full capacity and have their product well sold up, with the exception of nails and fence wire, for the remainder of the year. The greater part of the output at present is plain and barb wire, much of the latter being exported. Prices to the large trade are as follows: Wire nails, $1.65; galvanized nails 1 in. and longer taking an advance over this price of $1.75, and shorter than 1 in. $2.25. Plain annealed wire is $1.50; galvanized barb wire and fence staples, $2.50; painted barb wire, $1.80; polished fence staples, $1.80, all f.o.b. Pittsburgh, with freight added to point of delivery, terms sixty days net, less 2 per cent off for cash in ten days. Prices on woven wire fencing are 70½ per cent off list for carload lots, 69½ per cent for 1000-rod lots, and 68½ per cent for small lots, f.o.b. Pittsburgh.

Cold-Rolled Strip Steel.—New buying is light, as nearly all consumers are covered over the remainder of the year and some contracts have been made running into first quarter of 1916. Prices are firm and on prompt shipments premiums of $2 to $3 per ton have been paid. One mill reports it has stopped quoting on export inquiry, as it has its product sold up for the remainder of this year. An inquiry is in the market for about 2000 tons of cold-rolled strip steel for shipment to England. The base price now seems to be very firm. We quote hard-rolled steel, 1½ in. and wider, under 0.20 carbon, sheared or natural mill edge, per 100 lb., $3 delivered. Extras, which are standard among all mills, are as follows:

Thickness, in.	Extras for thickness	Extras for soft or intermediate tempers	Extras for straightening and cutting to lengths not less than 24 in.
0.100 and heavier	Base	$0.25	$0.10
0.099 to 0.050	$0.05	0.25	0.15
0.049 to 0.035	0.20	0.25	0.15
0.034 to 0.031	0.35	0.40	0.25
0.030 to 0.025	0.45	0.40	0.40
0.024 to 0.020	0.55	0.40	0.50
0.019 to 0.017	0.85	0.50	1.10
0.016 to 0.015	1.25	0.50	1.10
0.014 to 0.013	1.95	0.50	1.25
0.012	2.30	0.50	coils only
0.011	2.65	0.50	coils only
0.010	3.00	0.50	coils only

Skelp.—There is very little new inquiry, but the mills that roll skelp are turning their steel into one or two other products for which there is a heavier demand. Prices are firm. We quote grooved steel skelp at 1.30c. to 1.35c.; sheared steel skelp, 1.35c. to 1.40c.; grooved iron skelp, 1.70c. to 1.75c., and sheared iron skelp, 1.80c. to 1.85c., delivered to consumers' mills in the Pittsburgh district.

Railroad Spikes.—Some specifications for spikes came out in the past week, the Chicago, Burlington & Quincy and a Southern road each specifying for 2000 kegs. Spike makers report the demand from hardware jobbers for small lots as quite active. Specifications from the railroads have been dull for some time and very few new orders are being placed. We quote standard sizes of railroad spikes at $1.50, and small railroad and boat spikes at $1.60 per 100 lb., f.o.b., Pittsburgh.

Rivets.—Export demand is heavy. A local maker shipped last week two carloads of rivets to China, and is shipping this week two carloads to India. The domestic demand is active and the rivet makers have more orders ahead than for some months. We quote button-head structural rivets at $1.60 to $1.65, and conehead boiler rivets at $1.70 to $1.75, in carload lots, per 100 lb., f.o.b. Pittsburgh, smaller lots bringing about 10c. advance.

Hoops, Bands and Cotton Ties.—Most consumers are covered on their needs of hoops and bands over the remainder of this year, and mills report specifications coming in very freely. There is some export demand for both hoops and bands, but domestic mills are pretty well filled up and cannot in all cases make deliveries wanted on export inquiries. We quote steel hoops at 1.35c. to 1.40c.; bands, 1.35c., extras as per the steel bar card for delivery over the remainder of the year. Cotton ties are quoted at 86c. per bundle for delivery this month.

Iron and Steel Bars.—One local mill reports that on steel bars it is filled up for about four months and is not promising deliveries on new orders inside of that period. The demand for rounds for shrapnel is still very active, but no new large inquiries came out in the past week. The market on steel bars seems to be getting closer to 1.40c., and it is said several sales have been made at this figure for delivery in first quarter of 1916. All the steel-bar mills are running to utmost capacity and shipments are very heavy. Mills rolling iron bars report the demand more active and prices firm. The minimum on steel bars is 1.35c. and two of the larger makers are not anxious to sell, being sold up for the remainder of this year and believe they will obtain 1.40c. or better for delivery in first quarter and first half of next year. We quote steel bars at 1.35c. for delivery over remainder of the year; refined iron bars, 1.40c. to 1.45c.; common iron bars, 1.35c., and railroad test iron bars, 1.45c. to 1.50c., all f.o.b., Pittsburgh

Carwheels.—No new orders for carwheels are being placed, as there is practically no buying of cars, but the two local makers of carwheels report they have their output sold up for the remainder of this year and are much back in deliveries. We quote standard 33-in. freight carwheels, 6¼-in. rough bore, at $16, and standard 36-in. passenger, the same bore, at $22.50 per wheel, f.o.b., Pittsburgh.

Shafting.—There is not much new demand as consumers are covered for the remainder of this year and, in some cases, into first quarter of 1916. Specifications are very active, especially from the automobile builders and from screw stock concerns. The war is having its effect on the demand for shafting, a good deal of it finding its way into war munitions of various kinds. Prices are firm and we quote cold-rolled shafting at 64 per cent off in carloads and 59 per cent in less than carloads, f.o.b., Pittsburgh.

Nuts and Bolts.—Owing to the heavy foreign and domestic demand and the increasing cost of raw materials, prices on the smaller sizes of nuts and bolts have been slightly advanced. Makers report they are being swamped with orders, and have most of their output under contract for remainder of this year. Foreign shipments are heavy and this demand is increasing. Discounts to the large trade, effective from Sept. 8, are as follows:

Machine bolts, h. p. nuts, ⅜ x 4 in., smaller and shorter, rolled, 75, 10, 10 & 5; smaller and shorter, cut, 75, 10 & 10; larger or longer, 75 & 10. Machine bolts, C. P. C. & T. nuts, ⅜ x 4 in., smaller and shorter, 75, 10 & 5; larger or longer, 70, 10 & 7½. Common carriage bolts, ⅜ x 6 in., smaller and shorter, rolled, 75, 10, 10 & 5; smaller and shorter, cut, 75, 10 & 5; larger or longer, 75 & 5. Bolts without nuts, 6 in. and shorter, extra 10; longer lengths, extra, 5. Blank bolts, 75 & 10. Bolt ends with h. p. nuts, 75 & 10; C. P. C. & T. nuts, 70, 10 & 7½. Gimlet point coach screws and cone point lag screws, 80 & 15. Nuts, blank or tapped, h. p. square, 6c. lb. off; h. p. hexagon, 6.70c. lb. off; C. P. C. & T. square, 5.50c. lb. off; hexagon, ⅝ in. and up, 7c. lb. off; smaller, 7.50c. lb. off; C. P. plain, square, 5.40c. lb. off; hexagon, 5.80c. lb. off; C. P. semi-finished, hexagon, ⅝ in. and up, 85 & 10; smaller, 85, 10 & 10.

U. S. S. Cold Punched Blank and Tapped, Chamfered, Trimmed and Reamed

½ in. and smaller, hex.....7.25c. per lb. off
⅝ in. and larger, hex.....6.75c. per lb. off
Square, all sizes.....5.30c. per lb. off

Semi-Finished Tapped

½ in. and smaller, hex.....85 & 5 off
⅝ in. and larger, hex.....85 off

Black Bulk Rivets

7/16 x 6½, smaller and shorter.....80-10 off

Package Rivets, 1000 Pcs.

Black, metallic tinned and tin plated....75-10-10 off

Merchant Steel.—Most consumers are covered over the remainder of the year and are specifying freely against contracts. New orders are coming for small lots. Shipments by the mills this month will likely be as heavy as in August, which was a record month. Prices are firm. On small lots we quote: Iron finished tire, ½ x 1½ in., and larger, 1.60c. base; under ½ x 1½ in., 1.75c.; planished tire, 1.80c.; channel tire, ¾ to ⅞ and 1 in., 2.10c. to 2.20c.; 1 x ⅛ in. and larger, 2.20c.; toe calk, 2.20c. to 2.30c., base; flat sleigh shoe, 1.95c.; concave and convex, 2c.; cutter shoe, tapered or bent, 2.50c. to 2.60c.; spring steel, 2.20c. to 2.30c.; machinery steel, smooth finish, 2c.

Wrought Pipe.—The demand for merchant pipe is only fair, always being dull at this season. The mills report indications of a better demand for oil country goods, probably due to the recent advances in prices of crude oil. It is now said that the proposed order of the J. G. White Corporation for 120 miles of 8-in. pipe will not be placed. The pipe mills are running from 70 to 75 per cent of capacity. Discounts on iron and steel pipe are still being shaded more or less, depending on the order.

Boiler Tubes.—Mills report a slightly better demand for locomotive tubes, but merchant tubes are quiet. Discounts are still being shaded.

Old Material.—About the only activity in the local scrap market is in low phosphorus melting stock, the demand for which is heavy from foundries that are making castings for shrapnel purposes, and, the supply being limited, prices have again gone up, sales having been made at $19 and better, delivered to consumers' mills. While most dealers are asking $14.50 to $15 for heavy steel scrap, one or two sales have been made at $14.25 and several others at $14.50 to $14.75. We note a sale of 600 tons of low phosphorus melting stock at about $19.50 delivered, also 1500 tons of heavy steel scrap at $14.25 and 2000 tons of selected at $14.75, delivered. In spite of the lack of active demand, prices are firm. Dealers quote for delivery in the Pittsburgh and nearby districts that take the same rates of freight, as follows, per gross ton:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	$14.50 to $15.00
Compressed side and end sheet scrap.	13.00 to 13.25
No. 1 foundry cast	13.00 to 13.25
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	11.75 to 12.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	14.25 to 14.50
No. 1 railroad malleable stock	12.25 to 12.50
Railroad grate bars	8.75 to 9.00
Low phosphorus melting stock	19.00 to 19.50
Iron car axles	18.50 to 19.00
Steel car axles	16.00 to 16.50
Locomotive axles, steel	19.75 to 20.25
No. 1 busheling scrap	11.75 to 12.00
No. 2 busheling scrap	8.75 to 9.00
Machine shop turnings	8.75 to 9.00
Old carwheels	13.00 to 13.50
Cast-iron borings	9.50 to 9.75
*Sheet bar crop ends	13.50 to 14.00
Old iron rails	12.75 to 13.00
No. 1 railroad wrought scrap	13.00 to 13.25
Heavy steel axle turnings	10.25 to 10.50
Heavy breakable cast scrap	12.50 to 12.75

*Shipping point.

Coke.—There was more activity in contracts for blast-furnace coke in the past week than in any similar period for some months and prices are higher. A local interest took a contract for 12,500 tons each for November and December at $2 per net ton at oven, and another contract has been made for 5600 to 6000 tons per month for October, November and December at the same price. The Sharpsville Furnace Company has contracted for a six months' supply of coke, about 200 tons per day, with a local interest, the price being close to $2 at oven. Some contracts for blast-furnace coke now running on a sliding scale basis will expire Dec. 31, and negotiations are under way to renew them. These are now on the basis of $1.75 per ton minimum on $13 for basic iron, and the coke operators get one-sixth advance that may take place in basic iron. In other words, if the average price of basic iron for a month is $14.20, this is an advance of $1.20 a ton on the base price, and the operator supplying the coke

would get [illegible] per ton more. The coke operators propose in the new contracts to make the minimum price for coke [illegible] based on basic iron at $14 per ton, and one-sixth of all the advances made over that price. It is likely that some fairly large contracts on the new basis or slightly lower will be closed within the next month or [illegible]. Prices on blast-furnace coke for prompt shipment are higher and it is now held at $1.65 to $1.75 per ton at oven. There is not much demand for foundry coke, but prices are fairly firm. We quote standard makes of blast-furnace coke at $1.65 to $1.75 for prompt shipment, and on contracts for remainder of the year and into first quarter of next year, $2 per net ton at oven. We quote best grades of 72-hr. foundry coke at $2.10 to $2.25 for prompt shipment, and $2.40 to $2.50 on contracts for the remainder of the year, all per net ton at oven. The Connellsville *Courier* reports the output of coke in the upper and lower Connellsville regions for the week ended Sept. 4 as 379,935 net tons, a decrease over the previous week of 2671 tons.

Chicago

CHICAGO, ILL., Sept. 14, 1915.

The fact that a week may bring out more or less demand for steel products has lost much of its significance in view of mill conditions. While new business showed some slight increase and was approximately equal to shipments, it is generally true that buyers have taken the precaution to cover for their expected needs during the remainder of the year, and business is largely in the form of specifications. Inquiry for 1916 rails has not taken any tangible form in this territory, nor have any sales been made for that delivery. The structural situation from the standpoint of fabricators is looking very much better, both as to tonnage and prices. A feature of the market is the demand for blue annealed sheets, a local mill taking one very large order for car work, following which the price has been advanced to the basis of 1.50c., Pittsburgh. Black sheets are also $1 per ton higher. Shapes, plates, blue annealed sheets and bars out of store have each been advanced $1 per ton. Some of the bar-iron mills have been getting a better tonnage, largely for car work, and while 1.25c. can still be done, 1.30c. is frequently quoted. In this market the advance in pig-iron prices is being accomplished with much greater difficulty than elsewhere.

Rails and Track Supplies.—Reports of inquiry for 1916 rails lack verification in this territory. Although some of the railroads have given tentative consideration to their requirements, no negotiations have been inaugurated. The Clover Leaf road divided last week 3000 tons, giving 1500 tons to the Carnegie Steel Company, 1000 tons to the Lackawanna Steel Company, and 500 tons to the Cambria Steel Company. A few sales of track fastenings of minor importance are noted. We quote standard railroad spikes at 1.65c., base; track bolts with square nuts, 2.05c. to 2.10c., base, all in carload lots, Chicago; tie plates, $30, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, 1.25c., base, open hearth, 1.34c.; light rails, 25 to 45 lb., 1.07c.; 16 to 20 lb., 1.12c.; 12 lb., 1.17c.; 8 lb., 1.22c.; angle bars, 1.50c., Chicago.

Pig Iron.—Inquiry for iron for first half delivery continues plentiful, notwithstanding the liberal tonnages already booked. Prices are being asked on a number of lots of malleable and foundry iron of 1000 to 1200 tons, while a large steel foundry interest is in the market for 5000 tons of basic. At the district meeting of the American Pig Iron Association held here on Tuesday, it was made apparent that pig-iron sales in August and thus far in September were considerably in excess of what had been generally supposed and that furnace stocks are now exceedingly limited as the result. At least two producers in this market have advanced their quotations on foundry iron to a minimum of $14.25 for No. 2 and $15 for malleable. It is not yet established, however, that all of the furnaces in this district have fallen into line on this basis. For basic iron the price is not [illegible]ll defined. The inquiry for 5000 tons of basic is understood to have been closed at a price slightly better than $14, f.o.b. furnace. Of low phosphorus iron there appears to be a limited supply for early delivery, and quotations have been advancing rapidly. An inquiry for 3000 tons is noted. The market is also decidedly firm for silvery iron. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace, and do not include a switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 2 to 5	$15.75 to $16.25
Lake Superior charcoal, No. 1	16.25 to 16.75
Lake Superior charcoal, No. 6 and Scotch	16.75 to 17.25
Northern coke foundry, No. 1	14.50 to 15.00
Northern coke foundry, No. 2	14.00 to 14.50
Northern coke foundry, No. 3	13.75 to 14.00
Southern coke, No. 1 f'dry and 1 soft	16.00 to 16.50
Southern coke, No. 2 f'dry and 2 soft	15.50 to 16.00
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	17.25
Basic	13.75 to 14.00
Low phosphorus	24.00 to 24.50
Silvery, 8 per cent	19.50 to 19.75
Silvery, 10 per cent	20.00 to 20.25

Structural Material.—Fabricating shops have been the recipients of a much improved volume of work and are also securing better prices. Contracts closed last week aggregated about 6000 tons. The American Bridge Company will supply an additional 800 tons for the Overland Stores Company, St. Paul, 630 tons of plate girders for a Los Angeles highway bridge and 630 tons for a Western Pacific Railway viaduct. The Kenicott Company will build oil-storage tanks for the Santa Fe Railroad, taking 1000 tons of steel. The Canton Bridge Company took a 470-ton highway bridge for Hemphill County, Tex., and Worden-Allen Company, a 250-ton bridge at Green Bay, Wis. The Vierling Steel Company will supply 625 tons of structural material for immediate shipment, to be used in the rebuilding of the malleable foundry at St. Charles, Ill., recently destroyed by fire. The largest job of the week was the International Tailoring Company's building, for which the Hansell-Elcock Company will supply 1225 tons. There is very little new car buying, but the Chicago & Northwestern is contemplating the purchase of 500 cars and 45 locomotives. For the remainder of this year Chicago mills are practically out of the market with respect to new business in plain material. We quote for Chicago delivery of structural steel from mill 1.539c.

The expected advance in steel out of store has been announced and we quote for Chicago delivery out of stock 1.90c.

Plates.—In this territory the demand for plates has been perhaps the best indication of the progress of entirely local business. A slow but steady improvement has been manifested, and 1.30c., Pittsburgh, is now quite generally the market, although there is no assurance that 1.25c. would not be quoted on occasion. Specifications for car work, boiler and tank shops, and jobbers have been coming in steadily. We quote for Chicago delivery of plates from mill 1.489c.

The price of plates out of store has been advanced $1 per ton, and we quote for stock shipment 1.90c.

Sheets.—The most interesting phase of business in sheets is the demand for blue annealed, the price of which has now been advanced to the basis of 1.50c., Pittsburgh. One order, in particular, for a round tonnage of blue annealed sheets for car construction was booked last week by a local mill. Black sheets are also up $1 per ton, although the demand is limited. Galvanized sheets continue quotable on the basis of 3.75c., Pittsburgh, for No. 28, but the mills are pressing for business only on No. 24 and heavier. We quote for Chicago delivery from mill, No. 10 blue annealed, 1.589c. to 1.639c.; No. 28 black, 2.089c.; No. 28 galvanized, 3.939c.

We quote for Chicago delivery from jobbers' stock as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 2.10c.; No. 28 black, 2.55c. to 2.65c.; No. 28 galvanized, 4.35c.

Bars.—Business in steel bars for domestic consumption is entirely routine, while negotiations in connection with bars entering into export products are in an exceedingly uncertain state. With some of the bar-iron mills there seems to have been a marked improve-

ment in tonnage, and asking prices have been advanced by them to 1.30c., at mill. This improvement has not been general, however, and the 1.25c. price continues to apply. We quote mill shipment, Chicago, as follows: Bar iron, 1.25c. to 1.30c.; soft steel bars, 1.539c.; hard steel bars, 1.30c. to 1.35c.; shafting, in carloads, 65 per cent off; less than carloads, 60 per cent off.

We quote store prices for Chicago delivery: Soft steel bars, 1.80c.; bar iron, 1.80c.; reinforcing bars, 1.75c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting 54 per cent off.

Cast-Iron Pipe.—The Glamorgan Pipe & Foundry Company is the low bidder for 2000 tons of pipe at Chicago, the United States Cast Iron Pipe & Foundry Company was awarded 750 tons at Christford, Ill., and the 400 tons purchased for Craig, Col., will be cast in the Pueblo shops. Kansas City, Mo., will receive quotations Sept. 15 for 1000 tons. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $26.50; 6 in. and larger, $24.50, with $1 extra for class A water pipe and gas pipe.

Rivets and Bolts.—The advance of $6 per ton for rivets has been so rapid that some concessions from the present top price are not surprising, but increasing strength is apparent. Both specifications are steadily increasing and the market is looking better, though there can be no satisfactory test of prices until a new contracting period arrives. We quote as follows: Carriage bolts up to ⅝ x 6 in., rolled thread, 80-10; cut thread, 80-5; larger sizes, 75-15; machine bolts up to ⅝ x 4 in., rolled thread, with hot pressed square nuts, 80-15; cut thread, 80-10; larger sizes, 80; gimlet point coach screws, 85; hot pressed nuts, square, $6 off per cwt.; hexagon, $7 off per cwt. Structural rivets, ¾ to 1¼ in., 1.75c. to 1.85c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Old Material.—The past week in the scrap market has been one of marked quiet, with weaker elements increasingly pronounced. While a part of the inaction can be attributed to the observance of annual holidays, buyers have not yet resumed their interest in building up their supplies of scrap. An index of the market trend is had through a comparison of two scrap lists recently sent out by a local railroad. The second list brought out a markedly reduced number of quotations and generally lower prices. The railroads are still securing, however, a distinct advance over the consumers' market. This week the Soo Line is asking prices on about 1500 tons. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$13.50 to $14.00
Relaying rails	19.50 to 20.50
Old carwheels	11.75 to 12.00
Old steel rails, rerolling	13.25 to 13.75
Old steel rails, less than 3 ft	13.00 to 13.50
Heavy melting steel scrap	11.75 to 12.00
Frogs, switches and guards, cut apart	11.75 to 12.00
Shoveling steel	11.50 to 11.75
Steel axle turnings	9.50 to 9.75

Per Net Ton

Iron angles and splice bars	$13.50 to $13.75
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.75 to 11.25
Iron car axles	15.50 to 16.00
Steel car axles	14.75 to 15.25
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	10.25 to 10.75
Cut forge	10.50 to 10.75
No. 1 busheling	9.00 to 9.50
No. 2 busheling	7.00 to 7.25
Pipes and flues	8.25 to 8.75
Steel knuckles and couplers	11.00 to 11.50
Steel springs	10.25 to 10.75
No. 1 boilers, cut to sheets and rings	8.25 to 8.50
Boiler punchings	10.00 to 10.50
Locomotive tires, smooth	11.00 to 11.50
Machine shop turnings	6.75 to 7.00
Cast borings	6.50 to 7.00
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.75 to 9.00
Grate bars	8.50 to 8.75
Railroad malleable	10.25 to 10.75
Agricultural malleable	9.00 to 9.50

Wire Products.—The situation in wire is enlivened by the placing of some fall contracts and through this business the very strong attitude of the wire producers is made apparent. The mills are seeking only minimum tonnages from regular customers and the conditions are almost entirely determined by the export trade. Quotations to jobbers, per 100 lbs., are as follows: Plain wire, No. 9 and coarser, base, $1.689; wire nails, $1.839; painted barb wire, $1.989; galvanized barb wire, $2.689; polished staples, $1.989; galvanized staples, $2.689, all Chicago.

Philadelphia

PHILADELPHIA, PA., Sept. 14, 1915.

The expected purchasing of nearly 50,000 tons of basic pig iron materialized late last week, but the prices obtained were a disappointment to the sellers. The bulk of the iron went at $17.25, delivered, but some went at $17, whereas it had been pretty generally understood that the price would settle at about $17.50, the nominal quotation of to-day. Influences which affected the market were the selling of 10,000 tons by a producing consumer, and the offering here of some Western iron. With the steel mills there appears to be little change, many of them continuing to concentrate on shrapnel and high-explosive rounds and other specialties. In some instances business ordinarily sought for has been passed by. Plates, shapes and bars are quoted at 1.509c., Philadelphia; on current business, while $1 to $2 more per ton is obtained on forward delivery. A sale of 3000 tons of billets was made for export, also 2500 tons of steel axles. Several sales of Lake Superior iron ore have been made to eastern Pennsylvania furnaces. The scrap market has quieted down, but prices maintain their strength. A few carloads of ferromanganese have been sold for immediate delivery at $110 to $115, seaboard.

Pig Iron.—As was expected, an eastern Pennsylvania plate mill purchased over 45,000 tons of basic for its first quarter requirements, but the prices paid were not what sellers had anticipated. The bulk of the iron went at $17.25, delivered, while for some $17 was accepted, the latter including 5000 tons for delivery this year. Sellers assert that to-day they would object to anything under $17.50, while some are holding for $18, delivered. Two circumstances are held accountable for the prices paid, first, the acceptance by an eastern Pennsylvania consumer of $17 for 10,000 tons of surplus iron, and next the offering of 10,000 tons of Western iron, which, it is understood, carries a freight rate of $2.38 on deliveries to Coatesville. No details of this transaction are given. It appears certain that the consumer-seller first sold at $17, after which a compromise sale of 10,000 tons, the outcome of a promise to sell at the market, was made at $17.25. Then an offer, which the buyer refused to consider, was made of 20,000 tons at $17.50. Most of the furnace representatives were of the opinion that $17.50 was the price which might logically be obtained for first quarter, and that is now the nominal quotation. Other sales, all to the same buyer were: 7500 tons for first quarter at $17.25; 3000 tons at the same price and delivery; 5000 tons for delivery this year at $17, and 10,000 tons of Western iron, the offering of which had been feared by a few local sellers. Two or three other mills which are smaller buyers, as a rule, than the one which has just closed, are expected to enter the market at an early day. Standard low phosphorus is scarce and strong at $24.50 to $25, delivered. Producers are conserving their supply for their regular customers. There is no large inquiry for foundry grades. Consumers are pretty well covered for this year's requirements at the rate they are operating, and sales are therefore mostly confined to small lots needed to eke out. A good bit of inquiry for next year's delivery continues to come out, although the advances in prices have checked buying. One of the better sales was of 1000 tons of eastern Pennsylvania No. 2 X, which went at $16.29, prompt delivery. A maker of Virginia iron who has been quoting the minimum prices has advanced his quotations 25c., and is now asking $16, delivered, for No. 2 X and $15.75 for No. 2 plain, making the range of quotations $16 to $16.75 and $15.75 to $16 respectively.

In the week this furnace sold 2000 tons, which was a decline from previous weeks, although shipments are keeping up in an excellent way. Quotations for standard brands, delivered in buyers' yards, shipment this year, range about as follows:

Eastern Penna., No. 2 X foundry	$16.00 to $16.50
Eastern Penna., No. 2 plain	15.75 to 16.25
Virginia, No. 2 X foundry	16.00 to 16.75
Virginia, No. 2 plain	15.75 to 16.00
Gray forge	15.00
Basic	17.00 to 17.25
Standard low phosphorus	24.50 to 25.00

Iron Ore.—It is believed that shipping conditions will render foreign ore a little easier in the near future, but prices will still be such that only those who choose to pay a premium for certain qualities will be likely to buy. The present price of foreign ore ranges from 8c. to 8½c. per unit at tidewater. Eastern Pennsylvania furnaces have closed for some Western silicious ore from the Marquette Range, at $1.80, Lake port. Another furnace took 20,000 tons of the same ore, and other negotiations are rumored. It is reported that the ore interests are clearing up prior to establishing the price for next season which is expected to be 50c. higher. Heavy grain shipments are expected to strengthen Lake freights. Importations at this port in the week ended Sept. 11 consisted of 7800 tons from Chile, 13,000 tons from Cuba and 6925 tons from Sweden.

Ferroalloys.—The open quotation for 80 per cent ferromanganese is unchanged at $100, seaboard, forward delivery, although $110 and $115 have been obtained for carload lots of spot. A local firm expects an arrival of about 1000 tons around Oct. 15. The custom house reports no arrivals in the week ended Sept. 11. Ferrosilicon, 50 per cent, is unchanged at $73 to $75, Pittsburgh, according to quantities.

Bars.—Large inquiries for shrapnel and high-explosive shell rounds continue to be figured on by the trade. Local sellers have sold many thousands tons but are averse to giving details. They are quoting 3.25c. to 3.50c. for rounds of the kind referred to. For ordinary steel bars the quotation is unchanged at 1.509c., Philadelphia, and bonuses have been offered for prompt deliveries of small lots. Common iron bars are unchanged at 1.459c., Philadelphia, carload lots.

Plates.—On miscellaneous current business 1.509c. and in some cases 1.559c., Philadelphia, are obtained, while on last quarter contracts 1.609c. has been paid. There appears to be no let-up to the general demand, which has been augmented by locomotive and car work. The plates for two ships requiring about 2100 tons each has been placed with a Coatesville mill.

Structural Material.—To regular customers the price for shapes is 1.509c., Philadelphia, on good-sized lots, but in some cases 1.559c. is obtained. The mills are still reluctant to go heavily into the fourth quarter or into next year.

Sheets.—On contracts the principal eastern Pennsylvania maker is getting 1.759c. for No. 10 blue annealed, which is about $2 per ton higher than the Pittsburgh base.

Billets.—The demand continues good, with the quotations for rerolling billets ranging from $30 to $32, Philadelphia, and those for forging billets running as high as $38. An export sale of 3000 tons was made in the week.

Rails.—The 5000 tons of rails inquired for by the Southern Railway will be rolled by the Pennsylvania Steel Company. A nearby mill has received an order for 3000 tons from an Eastern railroad.

Coke.—Contracts for 1916 delivery of furnace coke continue to drag, and the market is considered somewhat weak. Prompt furnace is quoted at $1.60 to $1.75 and contract furnace at $2 per net ton at oven. Prompt foundry and contract foundry range from $2.30 to $2.60 per net ton at oven. Freight rates from the principal producing districts are as follows: Connellsville, $2.05; Latrobe, $1.85, and Mountain, $1.65.

Old Material.—The market is taking a breathing spell after transactions involving large tonnages, but no weakness is shown, and mills that have not bought must soon come forward with their requirements. Bids are to be received Oct. 9 at the navy yard, Philadelphia, for about 2000 tons of miscellaneous scrap. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to $1.35 per gross ton, are as follows:

No. 1 heavy melting steel	$15.00 to $15.25
Old steel rails, rerolling	15.50 to 16.00
Low phos. heavy melting steel scrap	20.50 to 20.75
Old steel axles	19.50 to 20.50
Old iron axles (nominal)	22.00 to 23.00
Old iron rails	18.50 to 19.00
Old carwheels	14.00 to 14.50
No. 1 railroad wrought	16.50 to 17.00
Wrought-iron pipe	14.00 to 14.50
No. 1 forge fire	11.00 to 11.50
Bundled sheets	11.00 to 11.50
No. 2 busheling	9.50 to 10.00
Machine shop turnings	10.50 to 11.00
Cast borings	10.50 to 11.00
No. 1 cast	14.00 to 14.50
Grate bars, railroad	10.50 to 11.00
Stove plate	10.50 to 11.00
Railroad malleable	10.50 to 11.00

Cincinnati

CINCINNATI, OHIO, Sept. 15, 1915.—(*By Wire.*)

Pig Iron.—The market is simply marking time and very little activity is reported in this immediate territory. It is, therefore, somewhat strange to note that prices are hardening. As far as can be ascertained all Southern furnaces are now quoting $11.50, Birmingham basis, for this year's shipment and only a comparatively small tonnage is obtainable below this figure. In fact, $11 spot iron seems to have disappeared, with only a limited quantity of resale iron offered at $11.25 for last quarter. Northern foundry, malleable and basic are very firm at $14, Ironton, for shipment this year, and it is rumored that the advanced asking price of $14.50 for first half business will be marked up at an early date. It is reported that two round lots of southern Ohio basic iron were sold recently to Eastern melters, the usual price schedule being maintained. A sale of 2000 tons of malleable, with shipments running through the first half, was also made to a melter in this territory. An Indiana consumer took 500 tons of Southern foundry and a central Ohio firm contracted for a like tonnage of Northern iron, with shipments extending through the first quarter. Inquiries include one from the Baltimore & Ohio Railroad for 1500 tons of analysis iron and another from the Louisville & Nashville Railroad for 500 tons of Southern foundry. An Indiana manufacturer also wants 500 tons of mixed foundry iron. Ohio silvery irons have hardened, and $17 at furnace is now considered the minimum for this year's shipment. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft	$14.65 to $15.15
Southern coke, No. 2 f'dry and 2 soft	14.15 to 14.65
Southern coke, No. 3 foundry	13.65 to 14.15
Southern No. 4 foundry	13.15 to 13.65
Southern gray forge	12.65 to 13.15
Ohio silvery, 8 per cent silicon	18.26 to 18.51
Southern Ohio coke, No. 1	16.26 to 16.51
Southern Ohio coke, No. 2	15.26 to 15.51
Southern Ohio coke, No. 3	15.01 to 15.26
Southern Ohio malleable Bessemer	15.26 to 15.51
Basic, Northern	15.26 to 15.51
Lake Superior charcoal	16.20 to 17.20
Standard Southern carwheel	26.90 to 27.40

(*By Mail*)

Coke.—The market has stiffened considerably, although the only tangible basis for an advance in foundry coke is that the production has been cut down in the Wise County and Pocahontas districts. The oven operators are at present more interested in increasing their sales of coal. A contract for furnace coke was made by an Ironton, Ohio, consumer with an Ashland, Ky., producer. The amount involved was 150,000 tons, with shipments to commence Jan. 1, 1916, and to be spread over a period of five years. The two remaining idle blast furnaces in the Hanging Rock district are expected to blow in soon, but it is understood that both of these have already contracted for a supply of coke. We quote Connellsville 48-hr. coke for prompt shipment at $1.60 to $1.65 per net ton at oven, and for last quarter at $1.70 to $2. Connellsville foundry coke ranges from $2.25 to $2.65, with the first-named figure

representing spot shipment. Wise County and Pocahontas operators have advanced quotations on furnace and foundry coke to an average between 15c. to 25c. a ton over the quotations named for the Connellsville district.

Finished Material.—There is an encouraging demand for small structural shapes and reinforcing concrete bars. This business seems to come principally from the smaller contractors who are taking advantage of the present open weather to push forward work on contracts that were previously closed. This condition of affairs has of course helped out the local warehouses in their sales. We quote structural shapes from stock at 1.90c. to 2c. and steel bars 1.85c. to 1.90c. The jobbers' price on No. 28 galvanized sheets remains at 4.50c. for less than carloads. The mill quotation on No. 28 galvanized sheets is slightly firmer and is around 3.75c., Pittsburgh basis. Black sheets have also stiffened a trifle and are quoted at 1.95c. to 2c., Pittsburgh, for No. 28. Hoops and bands are slow, but prices are firm.

Old Material.—The steel mills are taking large tonnages of scrap, and foundries are also melting a considerable quantity, but offerings are also heavy and have tended to keep the market on an even keel. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards:

Per Gross Ton

Bundled sheet scrap	$8.50 to	$9.00
Old iron rails	12.00 to	12.50
Relaying rails, 50 lb. and up	20.25 to	20.75
Rerolling steel rails	10.50 to	11.00
Heavy melting steel scrap	10.50 to	11.00
Steel rails for melting	10.50 to	11.00

Per Net Ton

No. 1 railroad wrought	$9.50 to	$10.00
Cast borings	6.25 to	6.75
Steel turnings	5.75 to	6.25
Railroad cast scrap	10.25 to	10.75
No. 1 machinery cast scrap	11.50 to	12.00
Burnt scrap	7.50 to	8.00
Old iron axles	15.00 to	15.50
Locomotive tires (smooth inside)	9.75 to	10.25
Pipes and flues	7.25 to	7.75
Malleable and steel scrap	8.50 to	9.00
Railroad tank and sheet scrap	6.50 to	7.00

Cleveland

CLEVELAND, OHIO, Sept. 14, 1915.

Iron Ore.—The buying of Lake Superior ore for this season's shipment is practically over. Ore firms have sold a few additional small odd lots in the past few days but expect no business in lots of any size. Dealers are well satisfied with the situation and are not eager to take on additional orders as they have about all they can handle between now and the close of navigation. Lake shipments are very heavy and practically all the freight boats are in commission. Wild vessel capacity is rather hard to find. We quote prices as follows, delivered to lower lake ports. Old Range Bessemer, $3.75; Mesaba Bessemer, $3.45; Old Range non-Bessemer, $3; Mesaba non-Bessemer, $2.80.

Pig Iron.—The market in the Cleveland territory is quiet, but local sales agencies report a fair volume of business in adjoining territories. The inactivity here, as compared with surrounding markets, is doubtless due to the recent advance in prices, which are higher in this territory than in some of the adjoining districts. Some first-half business was booked at the time prices were going up, but little new inquiry is now coming out. The bulk of consumers of foundry iron have not covered beyond January and being unwilling to pay present prices are apparently going to take chances on a further advance and wait until late in the year before placing contracts. While foundry iron is maintained at $15, Cleveland, for No. 2 for the last quarter and first half, Valley iron can still be had at $14.50, although most producers have advanced their asking price to $15, at least for the first half. One lake furnace interest that has been making sales at lower prices and has booked considerable tonnage in both malleable and foundry iron in small lots in the past few days has advanced its first-half quotation to $15, but is still booking orders at $14.50 for the last quarter. Steel-making iron is quiet, the only inquiry in the northern Ohio territory being for a 500-ton lot of basic. A few small-lot sales of low phosphorus iron have been made at $23.50 and $24, as compared with recent quotations of $23. Southern iron is quiet. Some resale iron is offered at $11 for No. 2, early delivery, but $11.50 is the general price for the last quarter. We quote delivered Cleveland as follows:

Bessemer	$16.90
Basic	15.30
Northern No. 2 foundry	15.30
Southern No. 2 foundry	$15.00 to 15.50
Gray forge	14.75
Jackson Co. silvery 8 per cent silicon	18.12 to 18.62
Standard low phos. Valley furnace	23.50 to 24.00

Coke.—Consumers are feeling the market for contracts for furnace coke for the next year, but producers are not quoting prices that are likely to result in any early business. However, there is considerable talk of sliding-scale contracts, and some of the first-half business may be booked on a sliding-scale basis. For prompt shipment producers are asking $1.70 to $1.75 per net ton at oven for standard makes. Foundry coke is quoted at $2.25 to $2.75, the higher price being for contracts extending through the first half.

Finished Iron and Steel.—Considerable inquiry is coming out for steel bars, plates and structural material for delivery after Jan. 1, but usually mills are declining to quote prices beyond the fourth quarter. Specifications are heavy and new demand is holding up well. There are various inquiries for steel for making shrapnel and other war material, but the only new order that is reported to have been definitely placed is for parts for 2,000,000 rifles taken by a Fremont, Ohio, manufacturer who has an inquiry out for 4600 tons of steel rounds for making these parts. The 33,000 tons of shrapnel rounds required by a Cleveland manufacturer have not yet been placed. While the demand from Ohio tank shops for plates is somewhat more active, plate mills are not crowded and fairly prompt deliveries can be secured. Plates can still be had at 1.30c., Pittsburgh. Steel bars are firm at 1.35c., Pittsburgh, and makers of hard steel have advanced prices $1 ton to 1.30c. The city of Cleveland will receive bids Sept. 16 for 500 tons of structural material for the Union Avenue grade crossing elimination. A new inquiry is out for 250 tons for a building for the Firestone Tire & Rubber Company, Akron, Ohio. The general contract for the addition to the Hollenden Hotel, requiring 1200 tons, has been placed with James Stewart. The Clover Leaf Railroad has placed 3000 tons of rails, 1500 tons going to the Carnegie Steel Company and 750 tons each to the Lackawanna and the Cambria Steel Company. The Carnegie Steel Company has also taken 500 tons from the Wheeling & Lake Erie Railroad. The latter road sent out inquiries for 850 freight cars, and the Erie Railroad is in the market for 25 locomotives. Sheets are fairly active. We quote black sheets at 1.90c., Ohio mill, for No. 28, blue annealed at 1.50c. for No. 10, and galvanized at 3.75c. for No. 28. Bar iron is quiet with quotations unchanged, at 1.25c., Pittsburgh. Warehouse prices are 1.90c. for steel bars and 2c. for plates and structural material.

Bolts, Nuts and Rivets.—The demand for bolts is heavy but new inquiry is not very active. Most consumers are under contract. Recent price advances are being well maintained. The demand for rivets has improved and there is a fair foreign demand, some coming from Greece and Russia, and an inquiry from Italy. Some fourth-quarter contracts are being placed at 1.70c., Pittsburgh, for structural rivets and 1.80c. for boiler rivets, or an advance of $2 a ton over prompt shipment prices. Revised bolt and nut discounts are as follows: Common carriage bolts, ⅜ x 6 in., smaller or shorter, rolled thread, 75, 10 and 10 per cent; cut thread 75 and 10; larger or longer, 75 and 5; machine bolts with h. p. nuts ⅜ x 4 in., smaller or shorter, rolled thread, 75, 10, 10 and 5; cut thread 75, 10 and 10 per cent; larger and longer, 75 and 10; coach and lag screws, 80 and 15; square h. p. nuts, blank or tapped, $5.80 off the list; hexagon h. p. blank or tapped, $6.30 off; c. p. c. and t. square nuts blank or tapped, $5.30 off; hexagon ⅝ in. and larger, $6.75 off; 9/16 in. and

smaller, $7.5[illegible] off; cold pressed semi-finished hexagon nuts ⅝ in. and larger, 85 off; smaller, 85 and 10.

Old Material.—The scrap market is dull and prices are not firm, although quotations are unchanged. Dealers, however, claim they can buy material at lower prices than a week or two ago. The dullness and tendency toward weakness is due to the fact that mills have been unable to use material as fast as it has been shipped on recent contracts. Embargoes have been declared at Monessen and Portsmouth. Local mills and a leading Youngstown consumer are holding back on shipments. The most active grade on the list is low phosphorus milling stock, considerable tonnage of which has been booked for shipment in the Pittsburgh territory. An out of town dealer has been inquiring in the local market for steel car axles for export to Italy, for which about $20 delivered New York has been offered. We quote f.o.b. Cleveland as follows:

Per Gross Ton

Old steel rails	$13.00 to $13.50
Old iron rails	14.00 to 14.50
Steel car axles	16.00 to 17.00
Heavy melting steel	12.50 to 12.75
Old carwheels	11.50 to 11.75
Relaying rails, 50 lb. and over	22.50
Agricultural malleable	10.00 to 10.25
Railroad malleable	12.25 to 12.75
Steel axle turnings	10.00
Light bundled sheet scrap	10.00 to 10.50

Per Net Ton

Iron car axles	$17.25 to $17.75
Cast borings	7.00 to 7.25
Iron and steel turnings and drillings.	6.00 to 6.25
No. 1 busheling	9.50 to 10.00
No. 1 railroad wrought	11.50 to 12.00
No. 1 cast	11.00 to 11.50
Railroad grate bars	9.00 to 9.50
Stove plate	8.75 to 9.00

Birmingham

BIRMINGHAM, ALA., Sept. 13, 1915.

Pig Iron.—While the selling has not been so active recently as it was a few weeks ago, Southern pig-iron manufacturers are satisfied with market conditions. There are still some lots of iron being sold for delivery in the latter part of the year while numerous sales are heard of in lots ranging around 500 to 1500 tons for delivery in the first quarter of 1916 and in a few instances through the first half. Minimum prices for delivery this year hover around $11.50 for No. 2 foundry, while the 1916 iron is not to be obtained at less than $12.50. Cast-iron pipe makers are said to have recently been sounding the market. Accumulated stocks at furnaces are being reduced steadily, the one company reported recently to have a large quantity of iron now has less than 100,000 tons and making sales steadily. Inquiry is in hand for a considerable tonnage for delivery next year and sales may be consummated during the week. One of the larger interests in this district completed a movement of seventeen cars of iron the past week, about 500 tons, bound for Genoa, Italy. The freight was prepaid on the movement, amounting to about $4,750. The production of 180,559 tons of iron in Alabama in August will be increased no less than 10,000 tons in September and the other months of this year. The Republic Iron & Steel Company has about completed repairs on its third furnace but is not scheduled for operation until Oct. 1 or perhaps Nov. 1. The Sloss-Sheffield Steel & Iron Company is figuring on a fifth furnace, but coke scarcity with this company holds it back. The statement in this report last week regarding active furnaces was incorrect as to charcoal furnaces. No Shelby furnace is active, while Rock Run, which has long been in operation, was overlooked. Rock Run furnace has been continuously operated since 1881, except for the periods in which it has been under rebuilding or repair. Steel market conditions continue very active. Representatives of foreign countries are in this district inspecting steel as it is manufactured and made ready for shipment on their orders. On pig iron we quote, per gross ton, f.o.b. Birmingham district furnaces, for the rest of this year and 1916 as follows:

No. 1 foundry and soft	$12.00 to $13.00
No. 2 foundry and soft	11.50 to 12.50
No. 3 foundry	11.00 to 12.00
No. 4 foundry	10.75 to 11.75
Gray forge	10.50 to 11.50
Basic	[illegible] to 12.50
Charcoal	[illegible] to 21.50

Old Material.—Conditions and prices are unchanged. We quote, per gross ton, f.o.b. yards, as follows:

Old iron axles	$13.50 to $14.00
Old steel axles	13.00 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	8.50 to 9.00
No. 1 country wrought	8.50 to 9.00
No. 1 machinery cast	9.50 to 10.00
No. 1 steel scrap	9.50 to 10.00
Tram carwheels	9.50 to 10.00
Stove plate	8.00 to 8.50

San Francisco

SAN FRANCISCO, CAL., Sept. 7, 1915.

Foreign inquiries continue to attract attention, though business is rather slow in closing, owing to such difficulties as fluctuating ocean freight and exchange rates, with which American manufacturers are not accustomed to contend. The last few days have brought a little more demand in nearby markets, and it is believed that the worst of the dull period is past. Many large corporations, however, whose purchases are normally a leading factor in the business, are still keeping out of the market, and building is very quiet.

Bars.—A little more inquiry for soft steel bars is coming from near-by manufacturing interests, some of whom are providing for future requirements, though the tonnage so placed does not appear to be heavy. Reinforcing bars are moving only on small orders, at least locally. Inquiries continue to come from the Orient, and some orders are being placed, but most of them are rather small. Owing to local competition prices are not keeping pace with those quoted in the East, and it is possible to buy in carloads from local mill or warehouse as low as 1.80c., and perhaps 1.75c.

Structural Material.—A new fabricator, the California Steel Company, is entering the field, having taken a contract for several hundred tons for the American Can Company. Figures are being taken on some more small country bridges. Two theater and store buildings in Oakland are also up for figures, but some doubt is felt whether either job will be closed.

Plates.—A fair tonnage is still coming out for marine work, and the outlook in this line is favorable. The Associated Oil Company has placed a contract with the Western Pipe & Steel Company for a 25,000-bbl. tank to be built near Martinez, Cal. The aggregate tonnage on other tank work is fair, but no notable inquiries are appearing. Little progress has so far been made on foreign business, but sales will no doubt be made shortly. Prices are firmly held on the basis of 1.35c., Pittsburgh, and specifications on old contracts are coming out well.

Sheets.—The consuming demand on black and blue annealed sheets is light, but specifications are picking up a little with the advancing prices. The sudden changes in galvanized are causing some dissatisfaction, and merchants are practically out of the market. Jobbing business in corrugated, however, shows a seasonable improvement, and unless the price goes out of sight again a nearly normal movement is expected. Jobbing prices on galvanized were reduced to the basis of 3.50c., Pittsburgh.

Wrought Pipe.—Trade is particularly dull. There is some expectation of new oil line business, but no important inquiries for either oil or waterworks supplies have appeared in the last fortnight, and the demand for small galvanized pipe for building is exceptionally light. A little more country business in small black pipe is expected this month, but has not yet appeared.

Cast-Iron Pipe.—The placing of a Los Angeles order for 750 tons is the only item worth mentioning at present. No new municipal inquiries have appeared in this vicinity, though a fair tonnage is coming out in the Northwest. Corporation buying is closely restricted. Prices are firmly held, and a further advance is expected.

Pig Iron.—No further arrivals of foreign iron are noted. The demand continues light and is supplied to an increasing extent with Southern iron, for which a number of contracts have been placed. Prices for for-

eign iron are irregular, but spot offerings of most varieties are firmly held. Southern iron is quoted at $21.50 to $22 per gross ton, San Francisco.

Coke.—A cargo of 1800 tons of German Syndicate coke arrived from Rotterdam late last month, and 1600 tons of Australian coke, not available for foundry use, has come in. Supplies in dealers' hands are ample for some time to come, but with uncertain shipping conditions they are holding firmly, foreign coke being still quoted at $14 per net ton, ex yard. Frequent shipments of domestic coke are also arriving, prices standing as before at $14 to $15 per net ton.

Old Material.—There is more demand for cast scrap, though no heavy tonnage is being purchased, and with liberal supplies prices remain at about $14 to $15 per net ton. Local steel plants are fairly well supplied with steel melting scrap and show little interest unless attractive prices are made. Dealers, however, are taking rather a firm view, anticipating a more active demand. Prices range from $7 to $9 per gross ton.

St. Louis

ST. LOUIS, Mo., Sept. 13, 1915.

Pig Iron.—The week has been active from the inquiry standpoint, chiefly for relatively small tonnages. The prices asked have had a tendency to check sales. Probably 6000 to 7500 tons of No. 2 Southern is pending on inquiries for last quarter. Consumers are getting anxious regarding 1916, but the stiffness of the furnaces is holding back contracts. Quite a number of brands are reported entirely out the market until more furnaces go in. Sales for the week totaled about 6000 tons.

Coke.—Very little business is doing, about all the foundries having contracted for their year's supply. Prices continue to be controlled by the local by-product competition.

Old Material.—Scrap quotations continue stationary, with considerable inquiry reported for foundry grades and steel. Rolling mill grades are looking up, particularly specialties. The speculative conditions, are disappearing. Considerable tonnage is going out of St. Louis for Eastern delivery and steel axles continue in heavy demand for export. Dealers are a little more anxious to sell but not enough so to result in any material declines in prices. Railroad lists closing this week include the Wabash with about 600 tons of relaying rails; the Union Pacific 1000 tons of scrap; the Big Four 1800 tons; the Missouri, Kansas & Texas 2200 tons; a Kansas City industry 350 tons and a local industry 900 tons of steel. We quote dealers' prices f.o.b. customers' works, St. Louis industrial district, as follows:

	Per Gross Ton	
Old iron rails	$11.00 to	$11.50
Old steel rails, rerolling	12.75 to	13.25
Old steel rails, less than 3 ft	12.50 to	13.00
Relaying rails, standard section, subject to inspection	21.00 to	23.00
Old carwheels	10.50 to	11.00
No. 1 railroad heavy melting steel scrap	12.00 to	12.50
Shoveling steel	9.50 to	10.00
Frogs, switches and guards cut apart	11.50 to	12.00
Bundled sheet scrap	7.50 to	8.00
	Per Net Ton	
Iron angle bars	$11.75 to	$12.00
Steel angle bars	10.00 to	10.50
Iron car axles	15.75 to	16.25
Steel car axles	14.75 to	15.25
Wrought arch bars and transoms	13.75 to	14.25
No. 1 railroad wrought	10.50 to	10.75
No. 2 railroad wrought	9.75 to	10.25
Railroad springs	11.25 to	11.75
Steel couplers and knuckles	11.00 to	11.50
Locomotive tires, 42 in. and over, smooth inside	12.00 to	12.25
No. 1 dealers' forge	9.25 to	9.50
Mixed borings	6.00 to	6.50
No. 1 busheling	9.00 to	9.50
No. 1 boilers, cut to sheets and rings	7.50 to	8.00
No. 1 railroad cast scrap	10.50 to	10.75
Stove plate and light cast scrap	8.50 to	8.75
Railroad malleable	8.75 to	9.00
Agricultural malleable	7.75 to	8.00
Pipes and flues	7.25 to	7.75
Railroad sheet and tank scrap	7.00 to	7.25
Railroad grate bars	7.00 to	7.50
Machine shop turnings	7.00 to	7.50

Finished Iron and Steel.—Fabricating shops report increased activity; in plates there has been a better demand; bars are in much better request; the demand for light rails has materially increased, but standard steel rails show no business though track fastenings are running ahead of contracts. Movement of stock out of warehouse is free at prices as follows: Soft steel bars, 1.80c.; iron bars, 1.75c.; structural material 1.90c.; tank plates, 1.10c.; No. 10 blue annealed sheets 2.10c.; No. 28 black sheets cold rolled, one pass, 2.60c.; No. 28 galvanized sheets, black sheet gage, 4.50c., subject to change without notice due to spelter irregularities.

New York

NEW YORK, Sept. 15, 1915.

Pig Iron.—The inquiry of the General Electric Company is the most important that has come up in the past week. It is for 32,600 tons of iron distributed as follows: High silicon, 17,600 tons; low silicon, 2600 tons; medium, 5700 tons; malleable, 2700 tons; low phosphorus, 4000 tons. Deliveries are to be made at the plants at Schenectady, N. Y.; Erie, Pa., and Lynn and Everett, Mass. The company presents alternatives in deliveries. The iron may all be delivered in the nine months beginning with October, or it may all be delivered in the first half of 1916, or it may all be delivered within the calendar year 1916. The expectation apparently is that lower prices will be bid on the portions of the order delivered in 1915. A textile machinery interest in New England is asking for 1500 tons, which being only a fraction of its requirements for the first half, indicates a disposition to locate the market. Some rather wide variations are seen in the quotations made by furnaces in response to New England inquiry. The range on western New York iron is from $15 to $16.50 at furnace for delivery in the early part of 1916. Virginia irons are generally quoted on the basis of $14 for No. 2 X for the first half of next year. There is no great amount of activity in foundry iron, melters generally showing a disposition to discover the trend of things before buying their iron for the first half. Being generally supplied for this year they are willing to let a few weeks determine, if they will, how substantial are some of the advances furnace men have been asking. We quote at tidewater as follows for fourth quarter delivery: No. 1 foundry, $16.50 to $16.75; No. 2 X, $16.25 to $16.50; No. 2 plain, $15.75 to $16; Southern iron, $16.50 to $17 for No. 1 and $16.25 to $16.50 for No. 2.

Ferroalloys.—Prospects for better shipments of British ferromanganese in September are not as bright as they were two and three weeks ago. In the case of one New York representative, actual advices to Sept. 15 indicate less alloy released for shipment this month than was reasonably expected. With some other representatives of British producers out of the market, September receipts, and even those for October, are not likely to exceed greatly the poorest month this year. Domestic independent producers are making some sales at not less than $115, delivered, and even higher is reported, but they are not pushing their product. The little that is received from abroad is delivered on old contracts but some sales of small lots are being made at $100 to $110, seaboard, subject to license to ship. A company mining manganese ore in northern Georgia or Alabama is said to be shipping to an Eastern domestic producer of spiegeleisen and ferromanganese. Various other shipments are heard of, as from Kansas, but the quantities are very small. The principal producer of 19 to 21 per cent spiegeleisen is reported out of the market though still selling some of the lower grade. A western Pennsylvania producer is selling at an advance of $2 over the former price or $28 at furnace. Ferrosilicon, 50 per cent, is active and strong both for domestic and foreign consumption. Domestic specifications on contract are heavy.

Structural Material.—Contracting for fabricated material is still dull in this locality. In view of that fact, the reports of the Bridge Builders and Structural Society that 85 per cent of the country's fabricating capacity was put under contract in August is highly encouraging, as it makes the average for the last six

months, that is, from March 1 on, over 73 per cent, or about 10 per cent better than in 1912. Prices for plain material are stiffer, more mills putting 1.40c., Pittsburgh, as the minimum; in fact, in some quarters it is felt that it is only a matter of days when the market will generally be at 1.40c. The largest steel project at present engaging interest is elevated railroad work in Philadelphia, about 27,000 lin. ft., which at 1 ton per foot would show a total of close to 27,000 tons. The Hudson County jail, Jersey City, it appears, will take about 1700 tons, and the Department of Docks is to build a piershed at Thirtieth Street, Brooklyn, taking 700 tons. About the largest single award covers the subway station for the New York Central at Forty-second Street and Lexington Avenue, 1500 tons, awarded to the Phoenix Bridge Company. Other awards include 400 tons at Searles, Cal., for the American Trona Corporation to the McClintic-Marshall Company; 700 tons for a smelting company at Tacoma to the Kansas City Structural Company, 250 tons for the Poole Engineering & Machinery Company, Woodbury, Md., to the Lackawanna Bridge Company, and 300 tons for additional building work for the Winchester Repeating Arms Company, placed by Westinghouse, Church, Kerr & Co., and 200 tons for 11 bridges for the New York Central divided between the Fort Pitt Bridge Works and Lewis F. Shoemaker & Co. We quote mill shipments at 1.35c. to 1.40c., Pittsburgh, or 1.519c. to 1.569c., New York. For small lots from store we quote 2.05c. to 2.10c., New York.

Steel Plates.—While 1.35c., Pittsburgh, is still done, 1.40c. is a frequent quotation. There is no snap to demand, but contract holders have taken fully, indicating that some material has gone into stock against the higher prices ruling to-day and much demand from these buyers in the last quarter is not looked for. In fact, the buyer is apathetic and there is indifference regarding fourth quarter contracts. Some tangible inquiry has appeared from Italy for boiler plates and for boiler furnaces. We quote mill shipments of plates at 1.35c. to 1.40c., Pittsburgh, or 1.519c. to 1.569c., New York. Plates from store are 2.05c. to 2.10c., New York.

Iron and Steel Bars.—Following closely the growing price stiffness of steel bars, iron bar manufacturers have generally raised prices $1 a ton, now quoting at 1.35c., Pittsburgh. More steel manufacturers have placed steel bars at 1.40c. minimum and are not considering contracts at all. Prices are subservient to questions of delivery, the degree of promptness having much to do with the price. With some mills deliveries on hot rolled products are extended 90 days, but there is still some space available for rounds for projectile purposes and some alertness to put this kind of bar business on the mill books. It is interesting that present inquiries for rounds seem to be chiefly for diameters of 4½ in. and upward, the belligerents apparently being satisfied on small sizes and now preparing for a supply of the large projectiles. We quote mill shipments of steel bars at 1.35c. to 1.40c., Pittsburgh, or 1.519c. to 1.569c., New York, and refined iron bars, 1.519c., New York. Out of store in New York iron and steel bars are 2c. to 2.05c.

Cast-Iron Pipe.—Manchester, N. Y., is about to contract for the installation of waterworks which will involve the purchase by the contractor of nearly 500 tons of pipe. No other municipal business of importance is in sight at this time. Private buying is of a moderate character, with no heavy quantities involved. Export inquiries continue to be received but appear to lead to little actual buying. Carload lots of 6-in., class B and heavier, are quoted at $24.50 to $25 per gross ton, tidewater, class A and gas pipe taking an extra of $1 per ton.

Old Material.—The volume of business is not large but buying is well distributed throughout all classes of scrap. Steel companies are doing less in the market than for the past few weeks, which is ascribed by some to purchase of material offered on railroad lists and by others to heavy shipments on contracts with dealers. Some companies are reported to be so well stocked that they are requesting dealers to hold back shipments for a time. Meanwhile, prices are well held. Brokers are paying about as follows to local dealers and producers, per gross ton, New York:

Old girder and T rails for melting	$12.25 to $12.50
Heavy melting steel scrap	12.25 to 12.50
Relaying rails	19.50 to 20.00
Rerolling rails	13.00 to 13.50
Iron car axles	22.00 to 22.50
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	14.00 to 14.50
Wrought-iron track scrap	13.00 to 13.50
No. 1 yard wrought, long	12.75 to 13.00
No. 1 yard wrought, short	12.25 to 12.50
Light iron (nominal)	4.00 to 4.25
Cast borings	8.00 to 8.50
Wrought turnings	8.00 to 8.50
Wrought pipe	12.00 to 12.25

Cast scrap is in somewhat better demand, although buyers are still disinclined to purchase for future delivery. Dealers' quotations to consumers of cast scrap are as follows, per gross ton, New York:

Old carwheels	$12.00 to $12.25
No. 1 cast (machinery)	12.75 to 13.00
No. 2 cast (heavy)	11.75 to 12.00
Stove plate	9.75 to 10.00
Locomotive grate bars	9.50 to 10.00
Malleable cast (railroad)	10.00 to 10.50

Buffalo

BUFFALO, N. Y., Sept. 14, 1915.

Pig Iron.—Buying has quieted down to some extent from the active demand of the last two weeks, owing to the stiff advance in prices, which is based on the booked up condition of furnaces to the end of the year. An inquiry has come before the market within the last day or two, however, for between 30,000 and 35,000 tons of various grades—comprised principally of foundry irons with some low phosphorus and malleable—from a large manufacturer of electrical apparatus. Two of the producers of the district are practically out of the market for the remainder of the year having very little unsold tonnage for that period. One of the four stacks of the Susquehanna furnaces is taken to its full capacity to fill the order of approximately 50,000 tons of hot metal for the Lackawanna Steel Company. The single interest which is in a position to take on tonnage over the remainder of the year has established a minimum of $15 furnace up to $16 and $16.25 for the higher silicon irons. Even off grade iron is bringing $2 per ton more than was paid for the ordinary lower grades two months ago. None of the furnace interests is inclined to quote freely for delivery into next year owing in part to the advancing price tendency of coke and the probable increase in the price of ore, as well as other elements. One producer has taken on a moderate tonnage of No. 2 X grade at $16, furnace, for January delivery and another producer a small tonnage at $16.25. Another interest has sold some special foundry iron at $17, furnace, for fourth quarter and first quarter delivery. The lowest price now obtainable for first quarter of next year is $15 furnace, including 2 plain, No. 3 foundry and gray forge. For 2 to 2.50 per cent silicon, $15.25 is the lowest; for 2.50 to 3 per cent and for malleable, $15.50; for 3 to 4 per cent, equivalent to No. 1 foundry, $16 and for higher silicons, 4 to 5 per cent, $16.50. Aside from the Lackawanna Steel purchase, the active buying for the past two or three weeks was principally from New England and tidewater points. The New York State foundries have not come actively into the market as yet. One of the stacks of a Buffalo producer, which usually operates on foundry grades, is now running on Bessemer. Basic is now firmly held at $16. Charcoal irons remain unchanged.

Finished Iron and Steel.—On most of the inquiries now appearing delivery is the element of consideration rather than price. Strong pressure is brought by customers to secure deliveries. Prices are firmly held at 1.35c., Pittsburgh, for remainder of year; although for some of the less desirable business and less than carload lots 1.40c. has been obtained. Deliveries are becoming more extended. Inquiry is very active for delivery to the end of the year and also to cover forepart of 1916, but sellers refuse to open their books after Jan. 1. The market for black and blue annealed sheets is stronger with a good buying demand and it

is expected prices will advance shortly. Mills are becoming quite fully sold up and deliveries are extended. Bolt prices have advanced on an average of 5 per cent for all classes for delivery to the end of the year. An inquiry is reported from Erie, Pa., for 36,000 tons of 9 x 30-in. forged rounds of 4 to 5 per cent nickel steel; but mills are not disposed to take it on account of the quick delivery limit required. The Buffalo Structural Steel Company has placed 100 tons of reinforcing bars for foundation work and concrete bins for the Archer-Daniels Linseed Oil Company, Buffalo River. Fabricators shops are well filled with orders. Users require quick deliveries and are paying higher prices. Bids are soon to be taken for Furniture Exchange Building, Jamestown, N. Y., 600 tons. The Strobel Steel Construction Company, Buffalo, was low on the readvertised bids, for the reconstruction of the Chicago street viaduct, this city, at $184,700 for six months' limit for completion and $183,200 for nine months; 2200 tons of structural steel and 500 tons iron castings will be required. The Ferguson Steel & Iron Company, Buffalo, will fabricate 600 tons of steel for the Archer-Daniels Linseed Oil mills, and 750 tons steel for the Curtiss Aeroplane Company's fourth addition to its plant this city. The John W. Cowper Company, Buffalo, has the general contracts for both structures. The Ferguson Steel & Iron Company also has contract for 500 tons of fabricated steel for shipment to Johannesburg, South Africa, for stamp mill and other mining structures. The Lackawanna Bridge Company has contract for 300 tons of steel for a boiler house at New Haven, Conn., for which the Westinghouse Church Kerr Company has general contract. The Progressive Steel Company, Buffalo, has 300 tons steel for the Church of Our Lady of Victory, South Buffalo, 100 tons for addition to foundry of the Atlas Steel Castings Company, Buffalo, and like amounts for high school, Orchard Park, N. Y., and an addition to Columbus Hospital, Buffalo.

Old Material.—The market continues active; largely on account of war order business; but it is hoped by dealers that railroad ordering will relieve the market of the artificial element occasioned by the war material activity. Prices continue firm with some commodities advancing slightly in price, particularly No. 1 railroad wrought and No. 1 railroad and machinery cast scrap, malleable, old carwheels, old iron rails, wrought pipe and bundled sheet and No. 1 and No. 2 busheling scrap. We quote dealers' asking prices per gross ton f.o.b., Buffalo, as follows:

Heavy melting steel	$13.00 to $13.50
Boiler plate, sheared	13.00 to 13.50
Low phosphorus steel	15.50 to 16.00
No. 1 railroad wrought scrap	12.50 to 13.00
No. 1 railroad and machinery cast	12.50 to 13.00
Old steel axles	16.00 to 16.50
Old iron axles	17.00 to 17.50
Old car wheels	12.50 to 13.00
Railroad malleable	12.50 to 13.00
Machine shop turnings	7.00 to 7.50
Heavy axle turnings	9.00 to 9.50
Clean cast borings	7.50 to 7.75
Old iron rails	15.50 to 16.00
Locomotive grate bars	9.50 to 10.00
Stove plate (net ton)	8.50 to 9.00
Wrought pipe	10.50 to 11.00
Bundled sheet scrap	9.50 to 10.00
No. 1 busheling scrap	10.00 to 10.50
No. 2 busheling scrap	8.50 to 9.00
Bundled tin scrap	10.00

E. H. Titchener & Co., manufacturers of staples, double pointed tacks and wire specialties, whose principal office is at Binghamton, N. Y., but who have for many years maintained a branch at 212 North Peoria Street, Chicago, Ill., have disposed of their interests at the place last named to an Illinois corporation, chartered as the Titchener-Diehl Company. Of the new corporation E. H. Titchener is president and Harvey Diehl is secretary and treasurer. The management of the business will be in the hands of Mr. Diehl, who has been in charge of the Chicago branch of E. H. Titchener & Co. for upward of eighteen years and is therefore thoroughly conversant with the requirements of the trade. The Titchener-Diehl Company expects to add to its facilities for rendering prompt and efficient service.

British Market Lifeless

Foreign Trade Greatly Handicapped—Pig Iron Inactive—Finished Steel Firm

(*By Cable*)

LONDON, ENGLAND, Sept. 15, 1915.

The pig-iron market is idle and the outlook is dull. Demand for home consumption is smaller and speculative operations are restricted. Foreign business is also checked by a scarcity of shipping tonnage and high freights. Furnaces in blast are 163, against 157 a year ago. Hematite iron is irregular at 95s. 6d. Iron ore is quiet, but firm. Tin plates are lifeless, the only business being a few small orders from France and Italy. Business with Greece is impossible because permits are refused. Finished steel is firm with great pressure exercised for government orders. Stocks of pig iron in Connal's stores were 141,187 tons at the close of last week, against 142,559 tons one week previous. We quote as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 17s. 10½d., against 18s. a week ago.

Cleveland pig-iron warrants, 64s. 10½d., compared with 64s. 4½d. last week.

No. 3 Cleveland pig iron, maker's price, f.o.b. Middlesbrough, 65s., against 64s. 6d. one week ago.

Steel black sheets, No. 28, export f.o.b. Liverpool, £11 15s.

Steel ship plates, Scotch, delivered local yards, £10 5s.

Steel rails, export, f.o.b. works port, £8 17s. 6d.

Hematite pig iron, f.o.b. Tees, 95s. 6d. compared with 95s. last week.

Sheet bars (Welsh), delivered at works in Swansea Valley, £7 5s.

Steel joists, 15 in., export, f.o.b. Hull or Grimsby, £10 10s.

Steel bars, export, f.o.b. Clyde, £12.

Ferromanganese, f.o.b., £20 15s.

Ferrosilicon, 50 per cent, c.i.f. £19 10s.

Metal Market

NEW YORK, Sept. 15, 1915

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York			Lead		Spelter	
Sept.	Lake	Electrolytic	Tin, New York	New York	St. Louis	New York	St. Louis
8	18.00	17.50	33.25	4.90	4.75	14.50	14.25
9	18.00	17.25	33.12½	4.70	4.55	14.00	13.75
10	18.00	17.25	33.25	4.70	4.55	14.00	13.75
11	18.00	17.25	.....	4.70	4.55	14.00	13.75
13	18.00	17.25	33.62½	4.70	4.55	14.00	13.75
14	18.00	17.75	33.37½	4.50	4.35	14.00	13.75

Copper is quiet but prices are higher, following advances at London. Tin prices change but little in a dull and uninteresting market. Lead is down 40 points, or $8 per ton. Spelter is unchanged except for an easier tendency. Antimony is inactive and easier.

New York

Copper.—Until yesterday the market was extremely dull and uninteresting, and while some of the electrolytic producers ostensibly were quoting 18c., 30 days, delivered, it was pretty generally understood that they would not turn down an offer of 17.25c., cash, New York. Yesterday 17.75c., cash, New York, was about the best that could be done in any direction. The quotation for Lake is unchanged at 18c. The stiffening of the price of electrolytic was due to an advance of £2 in the London electrolytic quotation. To-day London is up £1 10s. additional, which should have a good effect here. The higher market abroad is attributed to an optimistic view of the effort to float a large British war loan in this country. In line with the changed feeling second-hands immediately withdrew their low offers. Producers yesterday made sales aggregating a few thousand tons at close to 18c., full terms, but while more interest is being shown by consumers, the market still lacks life and snap. The ordinary domestic consumption continues very poor, and it is the war business alone that is supporting the trade. The exports this month totaled only 4535 tons.

Tin.—There has been but little business worthy of mention. On Sept. 9 there was a short-lived flurry in

far futures then quiet came again. On Monday there was fair inquiry for future metal but it did not culminate in business, inasmuch as sellers were unwilling to make sacrifices. The quotation yesterday for both spot and future deliveries was 33.37½c. There is some uncertainty as to how the new regulations imposed by Great Britain on export of tin plate, canisters, tin boxes, tin foil, solder, babbitt metal and alloys containing tin, which are published elsewhere in this issue, will work out. The regulations are a cause of irritation in the trade, but the necessity of comforming with them is generally recognized. The arrivals this month total 2035 tons and there is afloat 5148 tons.

Lead.—Except for fair-sized sales to Japan the market has been quiet. The cutting of prices by second-hands caused the American Smelting & Refining Company to lower its quotations twice, each cut bringing the price down 20 points, making an aggregate reduction of $8 per ton. The New York quotation yesterday was 4.50c., against 4.90c. at the beginning of the month. In seeking business second-hands shaded prices about 5 points. The St. Louis quotation yesterday was 4.35c. It is notable that London conditions are now more closely watched than those at St. Louis, and that they have a greater effect on the domestic market. Consumers are understood to be loaded up with relatively high priced lead. The exports this month amount to only 848 tons.

Spelter.—Prompt deliveries are quoted at 14c., New York, last quarter at 13c., prompt brass mill special at 16c. and Horsehead at 40c. A sale was made this week at the price last named. There has been considerable inquiry and some buying, with practically all of the interest in spot or nearby delivery, but on the whole few sales have been made. The belief that production is running ahead of present consumption has a depressing effect on the market. The galvanizing trade does not appear eager to buy and they are the principal consumers of ordinary prime Western. The St. Louis quotation yesterday was 13.75c. The exports this month total 1468 tons.

Antimony.—Chinese antimony, duty paid, is quoted at 27.50c. to 28.50c., the price being easier because of the desire to reduce surplus stocks. The quotation for metal in bond is 26c., equal to 28.50c.

Old Metals.—The market is stagnant. Dealers' selling quotations, which are nominal only, are as follows:

	Cents per lb.
Copper, heavy and crucible	16.50 to 16.75
Copper, heavy and wire	16.00 to 16.25
Copper, light and bottoms	14.00 to 14.25
Brass, heavy	11.50 to 11.75
Brass, light	10.00 to 10.25
Heavy machine composition	13.00 to 13.50
No. 1 yellow rod brass turnings	13.00 to 13.50
No. 1 red brass or composition turnings	11.50 to 12.00
Lead, heavy	4.25
Lead, tea	4.00
Zinc scrap	11.00 to 12.00

Chicago

SEPT. 13.—The cut in the price of lead by the leading interest and the decline in spelter prices were the only changes of note in the market of last week. Copper is holding steadily without much fluctuation in price. We quote: Casting copper, 17c.; Lake copper, 17.75c.; tin, carloads, 34c.; small lots, 36c.; lead, 4.65c. to 4.70c.; spelter, nominally, 13.75c.; sheet zinc, nominally, 16c.; Cookson's antimony. 47.50c. to 50c.; other grades, 32c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 14c.; copper bottoms, 12.50c.; copper clips, 13.50c.; red brass, 11.25c.; yellow brass, 10c.; lead pipe, 3.75c.; zinc, 9c.; pewter, No. 1, 18c.; tinfoil, 25c.; block tin pipe, 28c.

St. Louis

SEPT. 13.—Lead has moved both up and down again, being now quotable at 4.50c. to 4.60c. nominally. Spelter has had the same experience, being quotable to-day at 12.50c. to 13c. Tin is easy at 34c.; Lake copper, 18c.; electrolytic copper, 17.50c.; antimony, 31c. In the Joplin ore district prices swing up and down, with the range for 60 per cent zinc blende from $72 to $82 per ton, the lower grades being the stiffer. Top settlements for premium ores were about $85. Calamine was strong at $70 to $80 for 40 per cent ore. Lead ore was dull at $50 for 80 per cent. Miscellaneous scrap metals are quoted as follows: Light brass, 6.50c.; heavy yellow brass, 8.50c.; heavy red brass, 10c.; heavy copper and copper wire, 12c.; zinc, 6.50c.; lead, 3.50c.; pewter, 20c.; tinfoil, 28c.; tea lead, 3.50c.

Iron and Industrial Stocks

NEW YORK, Sept. 15, 1915.

Conflicting influences made themselves felt during the course of the past week. The sinking of the passenger steamship Hesperian by a German submarine caused uneasiness, and close on its heels was the demand made on Austria for the recall of its ambassador in this country for trying to check our manufacture of war munitions by fomenting strikes among the employees. Subsequently came further tension in our relations with Germany because of an unsatisfactory note relative to the sinking of the steamship Arabic. It was nevertheless felt that the relations with Austria and Germany would not develop to an acute point and the securities' market was not seriously depressed, while it was believed that financial conditions would be improved by the arrival of the Anglo-French financial commission to make such negotiations with our bankers as would restore stability to the foreign exchange market, thus enabling our manufacturers to continue to sell our products abroad on an expanding scale. The Government crop report, issued about the same time, showed a continuance of the extremely favorable conditions of previous months. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	38 - 42¼	Ry. Steel Spring, pref.	91 - 92
Allis-Chal., pref.	68 - 70⅝	Republic, com.	42¼ - 44½
Am. Can, com.	55½ - 59¼	Republic, pref.	101⅝ - 101⅞
Am. Can, pref.	105½ - 106	Rumely Co., com.	5 - 6
Am. Car & Fdy., com.	66½ - 70⅜	Rumely Co., pref.	8 - 9½
Am. Car & Fdy., pref.	116¼ - 116½	Sloss, com.	52 - 53⅝
Am. Loco., com.	51½ - 54	Sloss, pref.	90¼
Am. Loco., pref.	97 - 97½	Pipe, com.	20⅝ - 21¼
Am. Steel Fdries.	51 - 53⅝	U. S. Steel, com.	73¾ - 76½
Bald. Loco., com.	78½ - 81⅝	U. S. Steel, pref.	112⅞ - 114½
Beth. Steel, com.	290 - 349½	Va. I. C. & Coke	59 - 64
Beth. Steel, pref.	140½ - 152	West'gh'se Elec.	113⅞ - 116¾
Case (J. I.), pref.	78½	Am. Ship, com.	39
Colorado Fuel	44⅝ - 47⅞	Chic. Pneu. Tool	75½ - 78
Deere & Co., pref.	93½ - 95	Cambria Steel	58¾ - 65
General Electric	170⅛ - 172⅜	Lake Sup. Corp.	9⅝ - 12
Gt. No. Ore Cert.	40½ - 41⅞	Pa. Steel, com.	40½
Int. Harv. of N. J., com.	105 - 109	Pa. Steel, pref.	83 - 85⅝
Int. Harv. Corp., com.	70	Warwick	10½
Lackawanna Stl.	67¼ - 70⅜	Cruc. Steel, com.	84½ - 95⅝
Nat. En. & Stm., com.	24½ - 27⅜	Cruc. Steel, pref.	104⅛ - 107½
Pressed Stl., com.	60 - 63¾	Harb-Walk, Refrac., com.	60
Pressed Stl., pref.	98½ - 100	Harb-Walk, Refrac., pref.	99
Ry. Stl. Spring, com.	37⅛ - 39	La Belle Iron, com.	39 - 40

Dividends

The J. I. Case Threshing Machine Company, regular quarterly, 1¾ per cent on the preferred stock, payable Oct. 1.

The United Shoe Machinery Company, regular quarterly, 50 cents on the common and 37½ cents on the preferred stock, payable Oct. 5.

The American Locomotive Company, regular quarterly, 1¾ per cent on the preferred stock, payable Oct. 21.

The American Iron & Steel Mfg. Company, regular quarterly, 1¼ per cent on the preferred stock, payable Oct. 1. No dividend was declared on the common stock.

The Steel Company of Canada, regular quarterly, 1¾ per cent on the preferred stock, payable Nov. 1.

The Otis Elevator Company, regular quarterly, 1¼ per cent on the common stock and 1½ per cent on the preferred stock, payable Oct. 15.

The General Fireproofing Company, regular quarterly, 1¾ per cent each on the common and preferred stocks, payable Oct. 1.

The International Harvester Company of New Jersey, regular quarterly, 1¼ per cent on the common stock, payable Oct. 15. No action was taken on the Harvester Corporation common dividend.

Program of American Institute of Metals Meeting

The American Institute of Metals, which will hold its annual meeting this year at Atlantic City, N. J., simultaneously with that of the American Foundrymen's Association and with the exhibition of foundry and machine shop apparatus, has compiled its program.

On Tuesday morning, Sept. 28, there will be a joint session with the American Foundrymen's Association, as noted in last week's issue.

The program of the papers for the rest of the sessions is as follows:

Tuesday, Sept. 28, 2 P. M.

"Report of Official Chemist," by Arthur D. Little, Inc.

"An Investigation of Fusible Tin Boiler Plugs," by Dr. Charles Burgess, Bureau of Standards, Washington, D. C.

"The Influence of the Impurities of Spelter on the Cracking of Slush Castings," by Gilbert Rigg, New Jersey Zinc Company.

"Cobalt in Non-Ferrous Metals," by H. T. Kalmus, Kalmus, Comstock & Westcott.

"Furnace Methods for Pure Castings," by F. L. Antisell, Raritan Copper Works.

"Standard Test Specimen of Zinc-Bronze: Cu.88, Sn.10, Zn2. Relation of the Mechanical Properties to the Microstructure," by Dr. Rawdon, Bureau of Standards, Washington, D. C.

"Notes on the Copper-Rich Kalchoids," by S. L. Hoyt, University of Minnesota.

Wednesday, Sept. 29, 10 A. M.

"The Effect of the Present European War on the Metal Industries," by Thos. F. Wettstein, United Lead Company.

"Sherardizing," by Dr. S. Trood, U. S. Sherardizing Company, New Castle, Pa.

"Substitutes and Alloys to Take the Place of Platinum," by W. E. Mowrey, St. Paul, Minn.

"Alloys of Nickel, Chromium and Copper." by David F. McFarland and O. E. Harder, University of Illinois.

Wednesday, Sept. 29, 2 P. M.

"Aluminum Die Castings," by Charles Pack, Doehler Die Casting Company.

"The Manufacture and Use of Alumino-Vanadium," by William W. Clark, Seymour Mfg. Company.

"Recent Advances in the Manufacture and Uses of Aluminum," by E. V. Pannell, Toronto, Canada.

"The Welding of Aluminum," by E. V. Pannell, Toronto, Canada.

"Aluminum Bronze Alloys," by W. M. Corse, The Titanium Alloy Mfg. Company.

Thursday, Sept. 30, 10 A. M.

"Development of an Acid Resisting Alloy," by S. W. Parr, University of Illinois.

"Method of Analysis for Complex Alloys," by S. W. Parr, University of Illinois.

"The Effect of Changes in the Composition of Alloys Used by the American Railways for Journal Bearings," by G. H. Clamer, Ajax Metal Co.

"The Advantages of a Standard Railway Journal," by Russell R. Clarke, Pennsylvania Lines West.

Thursday, Sept. 30, 2 P. M.

"Forging Manganese Bronze," by Jesse L. Jones, Westinghouse Elec. & Mfg. Company.

"The Failure of Structural Bronzes," by Dr. Merica, Bureau of Standards, Washington, D. C.

"Experience with Brass in Civil Engineering Work," by A. D. Flinn, Board of Water Supply, New York.

"Stellite," by Elwood Haynes, Haynes Stellite Works.

The Pedrick Tool & Machine Company, 3640-42 North Lawrence Street, Philadelphia, Pa., has purchased the business, machinery, stock and equipment of the Sterling Machine Works, manufacturer of high speed Marathon tool grinders and the Sterling grinder. It is the intention of the purchasing company to continue the manufacture and sale of these grinders as soon as it has had a chance to reorganize the business under its own management. The machine equipment has been found particularly useful at this time owing to the immediate use to which it can be put in the company's regular line of work.

The Norton Iron Company, Norton, Ky., blew in its furnace last week. It had been out since July 3 for repairs.

The Franklin Institute's Season of Lectures

The Franklin Institute of Philadelphia, Pa., announces its program of lectures for the season from Oct. 7, 1915, to May 17, 1916. Among those may be mentioned the following, with the dates of presentation:

"Recent Progress in the Metallurgy of Copper," by Dr. Heinrich O. Hofman, professor of metallurgy, Massachusetts Institute of Technology, on Oct. 20, 1915.

"Magnetic Investigations of Iron and Steel," by John D. Ball, of the consulting engineering department, General Electric Company, Schenectady, N. Y., on Dec. 2, 1915.

"Coal Gas Residuals," by Fred. H. Wagner, chief engineer, the Bartlett Hayward Company, Baltimore, Md., on Jan. 6, 1916.

"Some Problems in Physical Metallurgy at the Bureau of Standards," by Dr. George K. Burgess, chief of the division of metallurgy, Bureau of Standards, Washington, on March 30, 1916.

"Use of Powdered Coal in Metallurgical Processes," by C. J. Gadd, chief engineer, American Iron and Steel Mfg. Company, Lebanon, Pa., on April 6, 1916.

"Scientific Research in Relation to the Industries," by Dr. Charles P. Steinmetz, chief consulting engineer, General Electric Company, Schenectady, N. Y., on April 19, 1916.

The lectures are weekly and the other topics are of an equally high order.

Rennerfelt Electric Fuurnace in United States

Active steps have been taken to introduce the Rennerfelt electric furnace into the United States and Canada for melting and refining steel. Hamilton & Hansel, 17 Battery Place, New York, have been engaged to conduct the campaign as agents of the Aktiebolaget Elektriska Ungar, Stockholm, Sweden. A description of this furnace was published in THE IRON AGE of Jan. 15, 1914. It is the invention of Ivar Rennerfelt, a Swedish engineer, and unusual success is reported to have attended its use in Europe. Latest advices are that thirty-two of these furnaces are now operating or contracted for. This is an increase of fourteen since Jan. 1, 1915, all in Europe.

The Monarch Refillable Fuse Company, Buffalo, N. Y., has bought a 150-ft. frontage on Leslie Avenue, Buffalo, and filed plans for a new factory, which include an experimental laboratory for investigating electrical devices this company will manufacture. This includes a soldering iron which generates heat at the point of contact, at the spot where the heat is needed for soldering. The object to be soldered bridges two carbon or carborundum high-resistance heating points. When the object is soldered, the tool is taken from the work and the current ceases to flow, as the circuit is opened. The soldering iron works in conjunction with a small transformer and is covered by patents.

The Thomas Davidson Mfg. Company, Montreal, Canada, has closed a contract with the Snyder Electric Furnace Company, 53 West Jackson Boulevard, Chicago, for the installation of a Snyder electric furnace. This furnace will be used in melting and refining cold steel scrap, producing high-grade steel for casting into blanks for the manufacture of shells. The Thomas Davidson Company manufactures tin and sheet steel products and the cuttings from its stamping department will be used, together with scrap available in the district, for melting down in the furnace.

On Monday, Sept. 6, No. 1 furnace of the Shenango Furnace Company, Sharpsville, Pa., made 642 tons of standard Bessemer iron. In August this stack turned out over 18,000 tons of Bessemer iron. The coke consumption was 1862 lb. per ton of iron. This is a remarkable record, both as to output and low fuel consumption.

The Thomas Iron Company, Hokendauqua, Pa., has placed a contract with Arthur G. McKee & Co., Cleveland, Ohio, for a hot blast stove, mains and pipes in connection with improvements of its blast furnace.

Small Decrease in Steel Corporation's Unfilled Orders

The Steel Corporation's monthly statement of unfilled orders on its books Aug. 31, 1915, shows a total of 4,908,455 tons as compared with 4,928,540 tons on July 31, 1915, a decrease of 20,085 tons. This slight decrease contrasts with an increase in July of 250,344 tons. On Aug. 31, 1914, the unfilled orders were 4,213,331 tons, and on Aug. 31, 1915, they were 5,223,468 tons. The following table shows the unfilled tonnage for each month beginning with the high point of Dec. 31, 1912:

Aug. 31, 1915	4,908,455	March 31, 1914	4,653,825
July 31, 1915	4,928,540	Feb. 28, 1914	5,026,440
June 30, 1915	4,678,196	Jan. 31, 1914	4,613,680
May 31, 1915	4,264,598	Dec. 31, 1913	4,282,108
April 30, 1915	4,162,244	Nov. 30, 1913	4,396,347
March 31, 1915	4,255,749	Oct. 31, 1913	4,513,767
Feb. 28, 1915	4,345,374	Sept. 30, 1913	5,003,785
Jan. 31, 1915	4,248,571	Aug. 31, 1913	5,223,468
Dec. 31, 1914	3,836,643	July 31, 1913	5,399,356
Nov. 30, 1914	3,324,592	June 30, 1913	5,807,317
Oct. 31, 1914	3,461,097	May 31, 1913	6,324,322
Sept. 30, 1914	3,787,667	April 30, 1913	6,978,762
Aug. 31, 1914	4,213,331	March 31, 1913	7,468,956
July 31, 1914	4,158,589	Feb. 28, 1913	7,656,714
June 30, 1914	4,032,857	Jan. 31, 1913	7,827,368
May 31, 1914	3,998,160	Dec. 31, 1912	7,932,164
April 30, 1914	4,277,068		

Smaller Shipments of German Steel Works

July shipments of the German Steel Works Union were 258,092 metric tons, compared with 318,952 tons in June, this year, a decrease of 60,860 tons. In July, 1914, the shipments were 470,422 tons or nearly twice those in July, this year. The July shipments were distributed as follows: Semi-finished material, 61,768 tons (128,056 tons in July, 1914); railroad material, 118,737 tons (186,231 tons) and shapes, 77,587 tons (156,135 tons). This is the lowest month since January, 1915, when the total shipments were 255,016 tons.

The American-McKenna Process Company, Milwaukee, Wis., which maintains rail renewing mills at Joliet, Ill., Kansas City, Mo., and Warners, N. J., on Staten Island Sound, will receive estimates from the Jobson-Gifford Company, 30 East Forty-second Street, New York City, contracting engineer, for the removal of the plant at Warners to Cumberland, Md. George R. Roe, representing the contractor, was in Cumberland recently investigating the proposed site. It is stated that the Baltimore & Ohio Railroad is interested in locating the plant at Cumberland. It has been out of operation for about two years.

Notice has been given by the Cambria Steel Company that the whole issue of the 6 per cent, three year gold coupon notes of 1914, series B, due Oct. 1, 1917, and redeemable Oct. 1, 1915, have been called for redemption by the company, at par and accrued interest as of Oct. 1, 1915, after which all interest thereon shall cease. The notes must be presented with all unmatured coupons attached at the banking house of Drexel & Co., Philadelphia, Pa., on Oct. 1, where payment will be made.

California produced almost the entire annual output of chromic iron ore reported in the United States in 1914, and a small output of chromite sand was reported from several points near Baltimore, Md., in that year. The opening of the Panama Canal is expected to obviate in large measure the difficulty of supplying California chromite to Eastern manufacturers.

A means of determining the exact fineness of cement is the result of three years' experiments at the U. S. Bureau of Standards. Details of the apparatus developed for this purpose are given in Technological paper, No. 48, just issued by the Bureau.

The H. M. Lane Company, Detroit, Mich., has been retained as consulting engineer in connection with the laying out of the foundry the Buick Motor Company is to build at its Flint (Mich.) plant.

Canadian Bounties for Zinc Refining

Bounties on the production of refined zinc in Canada from Canadian ores have been authorized by a recent order-in-council of the Dominion Government. The establishment of refining plants for treating both zinc and copper ores will probably follow. The bounties are tentative and will not go into effect unless the war is ended before July 31, 1917. The zinc refiners are willing to build the necessary plant only on a guarantee that orders from the shell committee will be ample to defray the cost and allow a reasonable profit. If the war closes suddenly the bounty will be payable up to July 31, 1917, the total not to exceed $100,000 in any case. The bounties are to be on a sliding scale, not exceeding 2c. per pound for refined zinc containing not more than 2 per cent impurities, and are not to be payable unless the standard price of zinc in London, England, falls below £33 per ton.

The Consolidated Mining & Smelting Company, Toronto, states that the Dominion Government has contracted for the entire output of its zinc reduction plant now being built at Trail, British Columbia. The ores are reduced by electrochemical treatment and the experimental plant is now producing 500 to 1000 lb. per day. The new plant, it is expected, will produce 25 tons of spelter per day before the end of 1915. It will be capable of using 10,000 hydroelectric horsepower from the West Kootenay Power Company.

Manganese Ore and Ferromanganese from Virginia

The Crimora Manganese Corporation, 15 Broad Street, New York, has completed drawings for its new mill for crushing and washing its deposits of high grade manganese ore at its mines at Crimora, Va. Construction of the first unit of this mill will be pushed to completion at once. Its output will be 100 tons of 45 to 49 per cent ore per day. The deposits were described in THE IRON AGE of April 8, 1915. It is not improbable that the proposal to erect a furnace and produce ferromanganese on the property may be carried out a little later.

Manganese Ore Stocks in the Caucasus

Present stocks of manganese ore in the Caucasus, Russia, are reported as 500,000 tons and about 18,000 tons, it is estimated, is lying at Batum ready for shipment. In 1914 the exports were 715,100 tons, of which 443,700 tons went out via Poti and 271,400 tons via Batum. Germany took 332,000 tons; Belgium, 160,000 tons and Great Britain 108,000 tons. No ore has been shipped since August, 1914. Reports from Poti are that exporters of manganese ore have commenced to replenish their stocks at the seaboard and that the railroad is slowly bringing down from the mines the ore delivered to it for conveyance to Poti before the war started. This activity is in anticipation of opening the Dardanelles.

Rich deposits of manganese ore are said to exist near Gladstone in Queensland, Australia, as well as large deposits in the Wide Bay district. Less than 20,000 tons of manganese ore has been mined in Queensland up to the present. It has been utilized in the Mount Morgan smelters. Antimony deposits found in the northern and also the Burnett districts are likely also to be developed.

The first vessel from New Castle, Australia, with zinc concentrates for the United States left there recently for Galveston, Tex., by way of the Panama Canal. This full cargo of concentrates comes from the mines of the Broken Hill Proprietary Company and is consigned to order. The vessel was formerly the Wotan, a German tank steamer of 3834 gross tonnage.

Can Companies' Gross Earnings

The American Can Company has not made public its gross earnings since it was incorporated, says the *Wall Street Journal*, but this information for 1913 was obtained by the Government in its suit against the company, and included in the Government's brief. The gross earnings of the company for 1913 were $38,652,508, and according to its annual report for that year the company showed net earnings of $6,595,679 before bond interest, sinking fund or depreciation was deducted. The net was equal to something over 17 per cent of the gross.

The document also gives the gross earnings of the principal competitors of the American Can Company, the largest of which is the Continental Can Company. For 1913 the latter showed gross earnings of $7,185,800, while its net was $788,016. This was for thirteen months and was for the first year of the present company's existence.

Some of the other competitors of the American Can Company mentioned in the Government brief are the Tin Decorating Company, Wheeling Can Company, United States Can Company, Southern Can Company, National Can Company, Pacific-American Fisheries, John Boyle Company, and Heekin Can Company. Practically all of these are privately owned concerns and none are listed on any of the well-known stock exchanges. The Tin Decorating Company is capitalized at $2,000,000 and did a gross business of $3,780,000 in 1913. It consumes annually about 500,000 base boxes of tin-plate compared with between 5,250,000 and 5,500,000 boxes by the American and 1,250,000 boxes by the Continental. The Tin Decorating Company is the third largest can company in the country and is owned by the American Tobacco Company. Its net earnings average about $500,000. The company sells about 75 per cent of its output to the trade, the rest being consumed by the American Tobacco Company, which takes the cans at the market price.

The Youngstown Sheet & Tube Extensions

The Youngstown Sheet & Tube Company, Youngstown, Ohio, is steadily placing contracts for large extensions to its plants at East Youngstown, the more important of these being as follows: To the McClintic-Marshall Company, the steel work, about 3000 tons, for the buildings to contain the new 9 and 12-in. merchant mills, which are to have roofs of the Pond type; to the Cleveland Crane & Engineering Company, three 15-ton, 96-ft. span and three 15-ton, 86-ft. span electric overhead traveling cranes; to the Westinghouse Electric & Mfg. Company, 15 a.c. motors for general mill work; to the Crocker-Wheeler Company, 50 d.c. motors, of which two 600 hp. and one 700 hp. are for driving the finishing stands of the 9-in. mill, and 24 of various sizes are for crane service; and all others are to the Raymond Concrete Pile Company, placing the piles required; to the Riter-Conley Mfg. Company, the steel work, about 400 tons, for power house No. 4, and boiler house No. 8; to the Sanford Riley Stoker Company, six 10-retort underfeed stokers for the new boilers; to the Pittsburgh Bridge & Iron Works, the highway approach to the coke plant, requiring about 100 tons of steel; to the McClintic-Marshall Company, the standard gage railroad bridge across the Mahoning River, connecting the main plant to the new coke works, requiring about 600 tons of steel; to the Dravo Contracting Company, contract for the foundations of the buildings and piers and abutments of the bridge.

Trumbull Steel Company's Extensions

The Trumbull Steel Company, Warren, Ohio, will shortly make a number of plant extensions for which an increase of capital stock from $2,500,000 to $4,000,000 has recently been authorized. The mill building will be lengthened 380 ft., a new bar shed, 580 ft. long will be built and the present bar shed lengthened 80 ft. Extensions of 420 ft. will be made to the annealing building and 400 ft. to the galvanizing department. The shear building will also be enlarged.

To Make S. K. F. Ball Bearings in this Country

On Sept. 4 the S. K. F. Ball Bearing Company, Hartford, Conn., was incorporated in that city with a capitalization of $2,000,000, to manufacture ball bearings on this side of the water. The S. K. F. ball bearing was introduced into this country in 1910, three years after the patents for the invention exploited by the parent concern, The Aktiebolaget Svenska Kullagerfabriken of Gothenburg, Sweden, had been granted. At that time the present American S. K. F. Ball Bearing Company was incorporated with a capital of $50,000 as a selling organization for the bearings manufacured by the Swedish concern.

The possibility of manufacturing in the United States has long been under consideration. It is now the intention to build a factory at Hartford, Conn. A site of about eight acres along the New York, New Haven & Hartford Railroad has been acquired and erection of the first building is to be shortly started.

The Swedish crucible steel, known as S. K. F. steel, used by the parent concern, with which the American company is closely allied, will be imported from abroad. The parent concern is placing its experience, special machines and manufacturing facilities at the disposal of the American company. Among the directors of the new company is B. W. Hanson, vice-president Pratt & Whitney Company, Hartford. The executives and other members of the old company will join the new corporation.

The S. K. F. Company states that it is one of the few importers who have not suffered interruptions in their source of supply and will not be forced to develop its American factory quicker than it is able to organize a plant. It is intended to start with a plant employing about 300 men.

New Simonds Bar Mill

The Simonds Mfg. Company, manufacturer of saws and knives, is installing at its steel mill at Lockport, N. Y., a bar mill which will consist of one train of 16-in. rolls and one train of 10-in. rolls, both motor driven. The new buildings necessary for this mill will be identical with those of the present plant, having steel frame, galvanized siding, and saw tooth tile roofs. The motor equipment will be on the same lines that have proved successful on the sheet mills of this plant and will include automatic control, etc. As is the case with the sheet mills, the product of the bar mill will be largely used by the company at its various factories, but there doubtless will be a certain tonnage to be disposed of. Contracts have been let, and it is hoped to have the mill in operation by Dec. 15.

The Alliance Machine Company, Alliance, Ohio, has received from the Broken Hill Proprietary Company, Newcastle, New South Wales, an order for one 75-ton and one 125-ton ladle crane and an additional 25-ton crane; also an order for two gantry cranes for the Australian government. Other recent orders include one 150-ton and two 50-ton ladle cranes and twelve 5-ton standard traveling cranes for the Jones & Laughlin Steel Company, and a 75-ton and a 125-ton ladle crane for the Republic Iron & Steel Company, for which the Alliance Company is also building a coke pusher and leveling machine. The Alliance Machine Company booked orders averaging a crane a day in July and August.

The New York section of the American Electrochemical Society will hold two meetings in conjunction with the National Exposition of Chemical Industries, at the Grand Central Palace, New York City, in the week of Sept. 20. On Tuesday evening, Sept. 21, the first meeting will be addressed by D. T. Pierce on "Trinidad Asphalt;" by Linn Brodley, on "Solution of the Dust, Smoke and Fume Nuisance by Electrical Precipitation," and by Harrington Emerson on "Efficiency in the Conservation of Our Natural Resources." The second meeting, on Saturday evening, Sept. 25, will hear addresses by John Barrett and Thomas H. Norton.

Pittsburgh and Nearby Districts

Operations of the steel mills in the Youngstown district are at high tide and promise to continue at this rate for some months. The Brier Hill Steel Company turned out more steel in August than in any month in its history. The Youngstown Sheet & Tube Company is operating its entire plant to 100 per cent of capacity, and has orders ahead for some months. It is making large shipments of barb wire and other products abroad and its wire mills are filled up with orders for practically the remainder of the year. The Republic Iron & Steel Company is also operating its works to full capacity and has made heavy shipments of billets abroad. All the blast furnaces in the Mahoning and Shenango valleys are now running except one Hubbard stack, blown out recently for relining and repairs, two stacks at West Middlesex and a small stack at Sharpsville. The foundry and machine shops are full of work, some of it for war materials, and the other various industries of Youngstown are in a more prosperous condition at present than at any time for some years. As yet there has not been a serious scarcity of labor in the district, but there is an urgent demand for every man that can be found, especially for common labor.

The Carnegie Steel Company, Pittsburgh, is in the market for six motor-driven lathes from 24 to 36 in., two 36-in. belt-driven lathes, completely equipped, and is also inquiring for a large hydraulic press.

The Greenville Steel Car Company, Greenville, Pa., has recently purchased a 24-in. open-gap punch and expects to be in the market for more equipment in the near future.

Reports that the Wheeling Corrugating Company, Wheeling, W. Va., had purchased a site in Chicago and would erect a plant to cost about $200,000 are incorrect. This company has owned a site in Chicago for a long time and proposes to erect a warehouse on it, but it will not cost above $100,000, if that much. It will not erect any manufacturing plant in Chicago or elsewhere.

The benzol plant of the Carnegie Steel Company at Farrell, Pa., which is in partial operation, is working very satisfactorily, with the rate of output as large as expected and the quality of the product fully up to the desired standard. This is the first benzol plant to be operated by the United States Steel Corporation, other plants being under construction at Ensley, Ala., and Gary, Ind.

The plant of the Leetonia Steel Company at Leetonia, Ohio, which was only partially completed, owing to financial troubles, has been sold to W. D. McKeefrey, who owns the McKeefrey blast furnace at the same place. The sale was made in order to clear the title of the plant. It is not unlikely that the blast furnace will be put in operation at an early date, but the steel plant is not in shape for use.

Hall furnace of the Republic Iron & Steel Company at Sharon, Pa., which has been idle a long time, resumed operations this week. The stack is expected to make from 250 to 300 tons of Bessemer iron per day.

The bi-monthly examination of the sales sheets of the Republic Iron & Steel Company and mills of the Western Bar Iron Association was held in Pittsburgh Sept. 13, and it was found that the average prices on shipments of common iron bars in July and August entitle the puddlers to a rate of $5.80 for puddling in September and October, against $5.70 in July and August. Wages of sheet and tin-plate mill employees will remain the same for this month and October as in July and August.

The Driggs-Seabury Ordnance Company, Sharon, Pa., expects to close this week contracts for shrapnel that may aggregate close to $10,000,000. The company is already turning out 6-in. shells, and these will form a large part of its output for some time.

The first fall and winter meeting of the Pittsburgh Foundrymen's Association will be held on Monday evening, Sept. 20, at the Fort Pitt Hotel, Pittsburgh. J. W. Howard, casualty manager for Edwards, George & Co., Pittsburgh, will address the meeting on the workingmen's compensation law. A. O. Backert, secretary American Foundrymen's Association, Cleveland, Ohio, is expected to be present and give an outline of the proceedings of that association at its convention to be held in Atlantic City, N. J., this month.

L. S. Schmidt, vice-president Knox Pressed & Welded Steel Company, Pittsburgh, has severed his connection with that company, and organized the Schmidt-McCormick Company which will manufacture pressed and welded steel specialties, with works and offices at Twenty-fifth Street and Allegheny Valley Railroad, Pittsburgh. Mr. Schmidt had charge of the open-hearth water cooled specialties for the Knox Company, and had been with the company since it was organized.

At a recent meeting of the board of directors of the Westinghouse Electric Export Company held in New York City, the following officers were elected: E. M. Herr, president; L. A. Osborne, vice-president; Calvert Townley, vice-president; Maurice Coster, managing director; J. C. Bennett, secretary; H. D. Shuts, treasurer; F. E. Craig, auditor, and W. H. Jones, assistant secretary and assistant treasurer. In addition, the president appointed the following officers: E. D. Mills, manager; E. R. Ellis, European manager, and H. F. Griffith, assistant export manager.

With the starting up of No. 2 furnace of the Carnegie Steel Company at Farrell, Pa., all the stacks of this company in the Mahoning and Shenango valleys are now in blast, except the small Niles furnace at Niles, Ohio. This is an isolated stack, idle for some years, and operated only in times of abnormal demand for pig iron. In the Pittsburgh district the company is operating all of its 34 blast furnaces except two Edgar Thomson, one Edith, and one Neville Island. One Isabella makes ferromanganese. The two Edgar Thomson stacks are likely to be the next put in blast in this district. The Edith and Neville Island are isolated stacks, having been idle more than seven years, and are not likely to be put in operation unless the demand for pig iron should make it absolutely necessary.

The adjoining boroughs of East Pittsburgh, Turtle Creek and Wilmerding have petitioned the courts to allow them to change their names to Westinghouse, in honor of George Westinghouse. At East Pittsburgh are located the large works of the Westinghouse Electric & Mfg. Company, Westinghouse Machine Company and the Pittsburgh Meter Company, while at Wilmerding is located the plant of the Westinghouse Air Brake Company. It is expected that the request will be granted.

The Adamantine Clay Products Company, North Mountain, W. Va., whose brick plant was recently burned with a loss of $75,000, has announced that a new plant with a capacity of 50,000 brick a day will be built. Charles D. Cushwa, Martinsburg, W. Va., is president.

J. Frank Johnson, Welch, W. Va., will build a $15,000 laundry and dry cleaning plant. A considerable amount of power equipment is included in the list of machinery requirements.

The LaBelle Box Company, Wheeling, W. Va., whose wooden box factory was recently burned with $30,000 loss, has announced that the plant will be rebuilt.

The Glass Brick Company, which is purchasing equipment for a plant to be established at Huntington, W. Va., is making its purchases at its Cincinnati office, First National Bank Building. It has bought its steam power equipment and is now in the market for pressure blowers.

The Auto Accessories Company, Wheeling, W. Va., has been incorporated with $5,000 capital stock for the purpose of manufacturing a device patented by P. F. Haberstick, one of the incorporators.

The Farris Engineering Company, constructing engineer, Pittsburgh, announces its removal from Jenkins Arcade Building to Empire Building.

HEAD OF MAXWELL MOTOR CO.

John C. Jay, Jr., Resigns from Pennsylvania Steel Company—R. W. Gillispie Succeeds Him

John C. Jay, Jr., of Philadelphia, has resigned as vice-president and general manager of sales of the Pennsylvania Steel Company to become chairman of the Maxwell Motor Company, Detroit. He gives up his work at Philadelphia Oct. 1 and assumes active charge at Detroit Nov. 1. Mr. Jay entered the New York sales office of the Pennsylvania Steel Company in 1902, coming from the plant at Steelton, Pa., where he spent his first year out of college. He was made manager of the New York sales office in 1906 and on Aug. 1, 1912, was appointed general manager of sales with offices in Philadelphia. Through the application of progressive organization methods Mr. Jay has won an important place in his company, his election as a vice-president coming within the past year. At a meeting of the directors of the Maxwell Motor Company in Detroit, Sept. 14, he was elected a director and chairman of the board.

Announcement is made by the Pennsylvania Steel Company of the appointment of R. W. Gillispie, New York district sales manager, to succeed Mr. Jay at Philadelphia as general manager of sales. He entered the employ of the Pennsylvania Steel Company in 1904 as apprentice, working through each of the departments at Steelton as a "learner." In 1905 he was transferred to the New York office and became assistant to John C. Jay, Jr., New York sales agent, in May, 1906. He succeeded Mr. Jay as district sales manager in the New York office in August, 1912. Mr. Gillispie brings to his new office the prestige of a successful administration at New York.

JOHN C. JAY, JR.

R. W. GILLISPIE

Mr. Jay Becomes Chairman of the Maxwell Motor Company, and is Succeeded as General Manager of Sales of the Pennsylvania Steel Company by Mr. Gillispie, for Three Years Manager of Sales of the Pennsylvania's New York Office

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The McArthur Concrete Pile & Foundation Company, 11 Pine Street, New York, has been awarded contracts covering the pile foundations of the office and three other buildings at the Willys-Overland Company's automobile plant in Toledo, Ohio. About 4700 concrete piles compose this contract. It has also received a contract from the Locomobile Company of America, Bridgeport, Conn., for the foundation of a new chimney.

Sarah furnace of the Kelly Nail & Iron Company, Ironton, Ohio, was blown in Aug. 2.

PERSONAL

G. H. Charls, general manager of sales, American Rolling Mill Company, Middletown, Ohio, has returned from a six weeks' sojourn on the Pacific coast, combining business with pleasure.

Albert Schmid, Paris representative of the Westinghouse Electric & Mfg. Company, is in this country on a business visit. Both the Westinghouse Electric & Mfg. Company and the Westinghouse Air Brake Company are manufacturing shells in their French plants. At the outset of the war the call to the colors practically denuded French shops of workmen, but as the need developed for mechanics for government work the men were released from the trenches and sent back to the shops. Mr. Schmid says that few machine tools are now being made in France inasmuch as the workmen are required for turning out munitions. Not only have American tools been imported in large quantities, but the great automobile shops are mainly equipped with American tools, and all are now working for the government. Mr. Schmid, who is at the Hotel Biltmore, was one of the first electrical engineers to be associated with George Westinghouse, whom he interested in an arc light in 1882. He plans to return to France about Oct. 2.

Col. H. P. Bope, vice-president and general manager of sales, Carnegie Steel Company, is president of the Pearsite Company of New York and Pittsburgh, which is working on a most promising process for the manufacture of dyestuffs. Other officials of the company are Arthur L. Pearse, vice-president, and Wheeler B. Horner, secretary. N. W. Niles of Boston is a director. Colonel Bope was toastmaster at the annual banquet of the Association of Iron and Steel Electrical Engineers held in Detroit, Mich., last week.

Benjamin G. Lamme, chief engineer, Westinghouse Electric & Mfg. Company, has been named as a member of the Naval Advisory Board by Secretary of War Daniels. He is chairman of the committee of the company which passes on all patents. He is the holder of about 140 patents and is known abroad almost as well as in the United States as an electrical engineer and designer of the highest rank.

Chairman John A. Topping of the Republic Iron & Steel Company is spending the month of September in Canada.

E. A. S. Clarke, president Lackawanna Steel Company, visited the offices of the company in New York this week for the first time since his illness of the past few months.

W. P. Snyder, president Shenango Furnace Company, Pittsburgh, has gone to California to attend the Panama-Pacific Exposition and will remain away about a month.

Frederick S. Conran, superintendent Torrington Mfg. Company, Torrington, Conn., has resigned to take a similar position in Newark, N. J. He will be succeeded by Henry Ellis from the Ansonia plant of the American Brass Company.

John D. Powell has been appointed to succeed A. T. Fletcher in charge of the Chicago office of the L. S. Starrett Company.

Joseph Janvren, purchasing agent for the Beloit Iron Works, Beloit, Wis., with which company he had been associated for more than twenty-five years, has resigned.

C. J. McGregor has been appointed assistant sales agent of the American Steel & Wire Company in its Cleveland office, succeeding Louis Bloomfield, who recently resigned to take up the practice of law in Cleveland. Mr. McGregor has been a salesman for the company for twelve years—ten years in New England and the past two years in the Chicago territory.

F. Lee Norton, second vice-president and general manager of the J. I. Case Threshing Machine Company, Racine, Wis., has resigned after twenty-seven years of service with the company and will give his attention to his stock farm nearby, retaining his financial interest in the company.

J. D. Mack, professor of civil engineering, college of engineering, University of Wisconsin, Madison, has been appointed State chief engineer of Wisconsin by the Railway Commission, with the approval of the Governor. He is the first incumbent of the position created by the Legislature a month ago. The salary has been fixed at $6,000 per annum.

Murray Guggenheim, chairman of the board of directors of the American Smelting & Refining Company, is a patient at Johns Hopkins Hospital, Baltimore, Md., suffering from a slight illness. He expects to leave the institution in a few days.

P. J. McEntree has been appointed superintendent of the plant of the Chester Steel Casting Company, Chester, Pa. He was formerly superintendent of the Solid Steel Casting Company and has held respensible positions with the Federal Steel Company and the Keystone Steel Casting Company.

R. E. Graves, First National Bank Building, Pittsburgh, has taken the agency for the William Cramp & Sons Ship & Engine Building Company, Philadelphia, for western Pennsylvania. He also represents in Pittsburgh the Cleveland Punch & Shear Works, Cleveland, Ohio.

The Epping-Carpenter Pump Company, Pittsburgh, has appointed F. S. Healey, an experienced steam and hydraulic engineer, as its representative in Boston, Mass. He will cover the New England territory.

The L. H. Gilmer Company, manufacturer of belts, 52 North Seventh Street, Philadelphia, Pa., announces that Manning J. Smith, formerly treasurer, is no longer connected with the company. At the last meeting of the directors J. S. Krauss, secretary, was also elected treasurer.

The United States Government will exhibit at the First National Chemical Exposition to open for one week at Grand Central Palace, New York, Sept. 20. The purpose of the exposition is to reveal the extent and importance of our chemical industries, and to show where we are lacking.

The Factory Products Export Corporation is now occupying its new offices at 61 Broadway, New York.

OBITUARY

WILLIAM DULLES, best known for his connection with the development of wire glass used as a fire protection in buildings, died suddenly Sept. 14 from heart disease at Fisher's Island, N. Y., aged 58 years. He was born in Philadelphia and was graduated from Princeton University in 1878. After practising law for a few years, he served for a time as a railroad official and in 1889 became treasurer of the Presbyterian Board of Foreign Missions, where he remained until 1897, when he turned his attention to the glass business, becoming president of the Appert Glass Company and vice-president of the Mississippi Wire Glass Company, at the same time being treasurer of both companies. He was interested in other corporations, and was president of the Dulles-Baldwin Electric Drill Company and a director of the Vulcan Mining Company. He belonged to a number of clubs. He leaves his widow, two sons and two daughters.

ROBERT A. MCKEE, manager of the steam turbine department of the Allis-Chalmers Mfg. Company, Milwaukee, Wis., died suddenly in a hospital at New York, following an attack of heart trouble while engaged in a business conference in the New York offices of the company. He was born in Towanda, Pa., in 1873, was a graduate of Lehigh University, took a post-graduate course at Cornell, became associated first with the Westinghouse Company and then the Allis-Chalmers Company twelve years ago. He had acquired a reputation as an engineer of great ability and was closely identified with the development of the Allis-Chalmers steam turbine. He was a member of the American Society of Mechanical Engineers and American Institute of Electrical Engineers. He leaves his widow and two children.

STEPHEN WOOSTER GOODYEAR, long well-known in Connecticut industrial circles, died in Waterbury, Conn., Sept. 8, aged 84 years. He started life as a blacksmith, but later became a skilled machinist, finally becoming mechanical superintendent of the Maltby, Hopson & Brooks Mfg. Company, Torrington, Conn., of which he became the presiding officer when the concern removed to Waterbury. His last active work was as New England representative of the Crucible Steel Company of America.

Employment in Germany

Employment in Germany on June 30, 1915, was 14.22 per cent less than on June 30, 1914, or 322,974 persons against 376,532 persons, according to the official journal of the German Department of Labor Statistics. This covers returns from 340 industrial concerns. More women were employed than in June, 1914, with a growing tendency in this direction indicated. Returns from 36 trade unions, with a membership of 1,057,137, apart from those serving in the war, showed that in the unions making returns, representing 998,563 persons, 2.6 per cent of the members were unemployed on June 30, 1915, against 2.9 per cent on May 31, 1915, and 2.5 per cent on June 30, 1914.

The California Steel Company, organized to conduct a structural fabricating business, is beginning the construction of a thoroughly equipped plant on Harrison Street, between First and Second, Oakland, Cal. E. H. Frisell, formerly San Francisco representative of Milliken Brothers, will be president of the new company, and Charles Spenser, for many years with the Western Iron Works, San Francisco, vice-president.

The Wheeling Ceiling & Roofing Company, North Warwood, W. Va., has awarded contract to the Riverside Bridge Company, Martins Ferry, Ohio, for the erection of another building to provide increased manufacturing capacity. It has added a complete line of galvanized and painted metal shingles to its products.

Machinery Markets and News of the Works

LARGER LATHES WANTED

Deliveries Restrain Industrial Buyers

Ball Bearing Company Will Make Bearings Formerly Imported—Steam Pump Company Making Lathes

The demand for lathes is now swinging to the larger sizes. Otherwise there is no change in the situation with regard to machine tools. Industrial buyers would like to buy in many cases, but are reluctant to commit themselves for machines that cannot be delivered for months to come. Inquiries for large groups of lathes are appearing almost daily. Time and again it has been believed that the peak of demand was reached, but buyers were not long out of the market. The Lucey Mfg. Corporation, Woolworth Building, New York, is taking estimates on one hundred 18-in. lathes. The International Steam Pump Company, which began the making of lathes for its own use, is now making them extensively for others, and has booked one order for 250 machines.

A new company, the formation of which was at least hurried by the war, is the S. K. F. Ball Bearing Company of Hartford, which will build a factory in that city for the manufacture of the ball bearings heretofore extensively sold here, but which were made in Sweden. Eight acres of land have been purchased at Hartford, and some orders for machine tools already have been placed. The Bridgeport Projectile Company, Bridgeport, Conn., is building a large extension to its forge shop.

The George A. Boyden Pump Company, Baltimore, Md., incorporated for $1,800,000, will build a plant in that city, and establish branches at Kansas City and San Francisco.

In Cleveland there are many inquiries for round lots of lathes for machining shells, while the demand emanating from plant extensions is active also. The automobile makers continue good buyers. Additional orders have been placed in central Ohio for British 4.5-in. high-explosive shells. Cincinnati is feeling a better demand for electric, drilling and grinding machinery.

The tool business in Detroit continues strong in widely scattered lines. The Republic Motor Truck Company, Alma, Mich., is erecting two additions to its plant, and will soon add a third of 35,000 sq. ft. The Fuller & Sons Mfg. Company, Kalamazoo, Mich., maker of transmission gears, clutches, etc., will erect a 4-story addition in which gear-cutting and special equipment will be installed. The H. Clauss Shear Company, Tipton, Ind., is to erect a 4-story factory 32 x 216 ft. In Milwaukee the domestic demand for machine tools continues at a high level, and the metal working trades of that city have increased their capacities from 45 per cent to 80 per cent in the past four months.

The demand for steam power equipment in the Central South is excellent, though prices are considered too low, while general machinery is in good demand. Activity is increasing in the Pacific Northwest, although the trade is hampered by lack of stock. Items from that territory report that the Port Townsend & Puget Sound Railroad may build a roundhouse and machine shop at Port Townsend, Wash., and that the Western Auto Company will establish an assembling plant to employ 75 men.

The Ford Motor Company has announced that it will erect a plant near Detroit, Mich., which will employ several thousand men in the manufacture of farm tractors.

New York

NEW YORK, Sept. 14, 1915.

One or two sellers of machine tools say there is a perceptible lessening in the demand for tools for the manufacture of munitions of war, but their observation is not that of the majority sellers. Lathes continue to lead the demand, but it is generally agreed that the call is now for the larger sizes, especially 24-in., such as would be required in manufacturing the larger sizes of shells. The aggregate of inquiry before the trade amounts to thousands of machines.

The Lucey Mfg. Corporation, J. F. Lucey, president, Woolworth Building, New York, wants bids on 100 18-in. x 7-ft. screw cutting engine lathes with compound rest, 4-step cone and single back-gear, with all standard equipment, but no quick change gear box or taper attachment.

Orders for several hundred lathes have been taken in the week. A turret lathe manufacturer who has greatly enlarged his facilities has taken orders for nearly 300 machines, while the International Steam Pump Company, New York, has taken one order for 250. This company originally took up the manufacture of lathes because it could not get satisfactory deliveries from tool builders for its own needs. It received so many inquiries from others in the same predicament that it determined to manufacture for the general market as far as possible.

An Allentown company is obtaining excellent results from a single-purpose lathe of extreme simplicity which it is building itself at a cost of less than $200 per machine. It has a short bed, so designed that the tool can be mounted on a bench or on a frame of angle iron or I beams. Its striking features, otherwise, are an extremely large bearing in the head-stock, a single-pulley belted to an overhead shaft and consequently a constant drive. It is figured that these machines can be scrapped when they have served their purpose.

A large machine tool building company in the East is seeking a company that will undertake a contract to build 50 engine lathes. Two or three companies that have well-equipped shops are willing to make the lathes, but their managers will not consider the proposition unless several hundred are specified. One company, for instance, would enter such a contract provided it meant about a year's work.

The Eddystone Munitions Company, Eddystone, Pa., is placing orders heavily. The war order of the American Can Company covers shrapnel only.

The S. K. F. Ball Bearing Company, which has been incorporated at Hartford, Conn., with a capital of $2,000,000 for the manufacture of ball bearings heretofore made in Sweden, has placed orders for a number of machine tools and will be in the market for more.

The Navy Department has requested bids on a few tools, including boring mills, lathes and planers for the Charlestown, Mass., Navy Yard. From the industrial field a few inquiries have been received, although manufacturers are slow to accept the forward deliveries now necessary. Second-hand tools are in good demand and more of them are

coming to [illegible] despite the fact that dealers' stocks were exhausted some time ago.

The Ka[illegible]fg. Company, 20 Morton Street, Brooklyn, N. Y., is in the market for equipment for hot tinning small articles, such as rivets, washers, etc.

E. J. H[illegible]s, 153 East Fifty-sixth Street, New York, is in the market for 30 lathes of the Morris type or equivalent for foreign shipment. Specifications call for a swing of from 400 to 520 mm., length of bench, 2400 mm., and approximate weight of 1200 kilos. One-third cash will be paid with order, balance cash against documents. Quotations must include date of delivery, and price if possible c.i.f. Liverpool or London, or else f.a.s. New York.

J. F. Farish, 66 Warren Street, Brooklyn, N. Y., is in the market for three heavy pattern back-geared screw-cutting gap engine lathes of 24-in. swing and 10 to 12-ft. bed, new or in good condition.

The Brooklyn Foundry Company, Boulevard and Orchard Street, Astoria, Long Island, N. Y., manufacturer of gray-iron castings, suffered a loss by fire of about $20,000 Aug. 29, when its offices and pattern shop were totally destroyed. It will resume business about Sept. 15.

The Borden Condensed Milk Company, 108 Hudson Street, New York, has purchased a site 27 x 90 ft., adjoining its plant at Long Island City, N. Y., which is to be enlarged. No plans have been drawn for any changes to date.

Crandal, Stone & Co., Binghamton, N. Y., manufacturers of automobile hardware, etc., have awarded contract to B. Klein & Son, 26 Highland Street, Binghamton, for the erection of a four-story brick and steel factory, 40 x 100 ft., to cost about $20,000. It is to give more floor space for their present production.

The John S. Tilley Ladders Company, Watervliet, N. Y., manufacturer of ladders, has completed plans for the rebuilding of its plant which was destroyed by fire.

The Houk Mfg. Company, Buffalo, manufacturer of the detachable wire wheels for automobiles, will construct an addition to its plant at Elmwood Avenue and the New York Central Railroad.

The Militaire Autocycle Company of America, Buffalo, has been incorporated with a capital stock of $250,000 to manufacture autocycles, bicycles and motor vehicles. N. R. Sinclair, Edward McM. Mills and George C. Miller, Fidelity Building, Buffalo, are the incorporators.

Plans are in preparation for rebuilding the paper manufacturing plant of Jansen Roberts, Poughkeepsie, N. Y., recently destroyed by fire.

The Cochrane-Bly Machine Company, Rochester, N. Y., has let contract for erection of an addition to its plant.

The State Armory Commission, Albany, has let contract for the erection of a storage building, 46 x 235 ft., at Peekskill, N. Y., to the Catskill Supply Company, Catskill. The cost without equipment will be $20,000.

Plans are being completed by the Niagara Falls Power Company, Niagara Falls, N. Y., for the installation of three additional units at its power plant. The estimated cost of the necessary equipment is $1,000,000.

The Curtiss Motor Company, manufacturer of motors for aeroplanes, etc., has leased factory space in the Century Telephone Company's manufacturing building at Elmwood Avenue and the Erie Railroad, Buffalo, and has installed the necessary equipment.

The Michigan Limestone & Chemical Company, Calcite, Mich., is establishing a branch plant at Buffalo, N. Y., where it is erecting a building, 37 x 80 ft., four stories, at Louisiana and Saint Clair streets and the Erie Railroad. Special machinery will be installed for the grinding and pulverizing of limestone and the manufacture of soil fertilizing preparations. The capacity of the plant will be 250 tons per day.

The Buffalo Pitts Company, Buffalo, has received an export order for 400 threshers and traction engines. This order will give steady employment for several months to 600 men. The company is also experiencing heavy domestic demand for threshers and tractors because of the anticipated bumper crops.

The Imperial Engineering Company has been incorporated at Albany by H. Poege, H. and D. Morris, 277 Broadway, New York City, and will manufacture steam separators, boilers and machinery. The capital stock is $25,000.

The National Bridge Works, Review Avenue, Long Island City, N. Y., will construct a one-story building for the By-Products Chemical Company, 219 x 400 ft., to be completed Nov. 1.

The E. R. Merrill Spring Company, 526 West Twenty-eighth Street, New York City, manufacturer of automobile and truck springs, is having plans prepared by Paul C. Hunter, architect, 191 Ninth Avenue, New York, for alterations to two buildings and the erection of two other buildings to provide additional space for new business. No definite decision has been reached as yet regarding the improvements.

E. T. Trotter & Co., 576 Johnson Avenue, Brooklyn, N. Y., manufacturer of insulating materials, are enlarging their factory in anticipation of increased business in the near future.

New England

BOSTON, MASS., Sept. 13, 1915.

The agitation for an 8-hr. day without reduction in wages continues to spread through New England, where many plants are busy on war munitions and war machinery orders. In some cases compromise offers have been accepted and in many instances there has been no demand for recognition of the unions. Some manufacturers directly interested in war orders have voluntarily granted shorter working hours with a corresponding increase in day and piece wages without waiting for formal demands from their employees.

Among the Springfield, Mass., plants which have adopted the 8-hr. schedule are the Bosch Magneto Company, Baush Machine Tool Company and National Equipment Company. In Torrington, Conn., the Torrington Mfg. Company, Excelsior Needle Company, Standard Company and Progressive Mfg. Company have posted notices of a 55-hr. working schedule with 10 per cent increase in wages. The American Brass Company, Waterbury, Conn., has announced a 10 per cent increase in wages, a 55-hr. working week and time and one-half for overtime, applying to all its plants in the Naugatuck Valley. The Pilling Brass Company, Waterbury, Conn., has given its employees a 10 per cent increase in pay with time and a half for overtime on a basis of a 60-hr. week. The New London Ship & Engine Company, Groton, Conn., has announced a bonus of 10 per cent weekly added to the wages of its men.

The powerhouse and accumulator building of the Bridgeport Projectile Company, Bridgeport, Conn., are nearly completed and an extension, 100 x 100 ft., to the forge shop has been started.

The Phillips Insulated Wire Company, Pawtucket, R. I., has awarded a contract for an addition to its factory, 78 x 110 ft., one and two stories.

The Royal Equipment Company, Bridgeport, Conn., has begun the addition of another story to its plant on Bostwick Avenue.

A. B. & J. Rathbone, wire manufacturers, Palmer, Mass., have awarded a contract for a building, 40 x 160 ft., one story and basement.

The Mysto Mfg. Company, New Haven, Conn., will build a brick and concrete plant, 50 x 50 ft., two stories.

The United Smelting & Aluminum Company, New Haven, Conn., will build an addition, 20 x 40 ft., two stories.

The foundation has been started for the reinforced concrete boilerhouse of the Mead-Morrison Company, East Boston, Mass. The building will be 80 x 150 ft., one story.

F. C. Phillips, Stoughton, Mass., manufacturer of screw machine products, is building a machine shop, 30 x 75 ft., one story, on Washington Street.

It is reported that the United States Gutta Percha Paint Company, Providence, R. I., will build an addition 51 x 83 and 10 x 27 ft., four stories and basement, to its main plant on Dudley Street.

The United German Silver Company, Springdale, Conn., is completing a one-story foundry building, 45 x 100 ft.

It is reported that the entire west armory of the Colt's Patent Firearms Mfg. Company, Hartford, Conn., will be equipped with new machinery for the manufacture of the improved water-cooled model of the Vickers-Maxim rapid-fire gun for which it is understood the company has orders from both the British and the United States governments. It is also reported that the new model Vickers-Maxim will be manufactured by the United States Government at the Springfield arsenal as soon as the machinery required can be secured. The west armory is to be vacated Oct. 1 by the firms now occupying it.

The Plume & Atwood Mfg. Company, Thomaston, Conn., has announced a 55-hr. week without reduction of pay and time and a half for overtime. The change went into effect Sept. 7.

The Andrew Terry Company, Terryville, Conn., has given its molders an increase of 25 cents per day.

The Brown Engine Company, Fitchburg, Mass., which made an assignment some time ago, has been purchased by Moses Perault. It is reported that the plant will resume operation under the management of Mr. Perault.

The plant of the Fuller Mfg. Company, Blatchley Avenue, New Haven, Conn., has been purchased by the Maxim Munitions Corporation, a new company. Hiram Percy Maxim stated that the plans of the new concern would be announced in a few days.

The Winchester Repeating Arms Company, New Haven, Conn., has been granted a permit to build a four-story building, 60 x 134 ft., on Sheffield Avenue.

The Crofoot Gear Works, Cambridge, Mass., has been granted a charter with an authorized capital of $40,000. Charles E. and Abi L. Crofoot and Ethelburt V. Crahill are the incorporators.

Philadelphia

PHILADELPHIA, PA., Sept. 13, 1915.

Permission has been granted the Baldwin Locomotive Works to construct a bulkhead at its property at Eddystone, Pa. The work will be started immediately and when completed shipments by steamer will be made directly from the Baldwin and the Remington Arms Company plants.

The H. A. May Foundry Company, Thirtieth and Chestnut streets, Philadelphia, Pa., suffered a loss by fire Aug. 22 in its core box storage room amounting to about $10,000. It continued operations in spite of the damage and reports that it is rushed with orders.

Bids will be received until Nov. 17 for a three-story brick and concrete powerhouse, 129 x 178 ft., for the Central Heating, Lighting & Power Plant, Washington, D. C. James A. Wetmore, Washington, is the architect.

A permit has been granted to the Abrasive Materials Company, James and Fraley streets, Bridesburg, Philadelphia, Pa., manufacturer of grinding wheels, for an addition to its boilerhouse, to cost $1,200.

C. E. Roberts, 1352 Locust Street, Reading, Pa., is having plans drawn by J. Earle Hickman, 119 South Fifth Street, Reading, for a one-story garage, 50 x 100 ft., of brick, to cost about $7,000.

William Shimer, Son & Co., Freemansburg, Pa., manufacturers of light hardware and iron toys, are receiving bids for two-story brick and steel factory buildings, 75 x 242 ft., 75 x 100 ft., 60 x 75 ft. Peuckert & Wunder, 310 Chestnut Street, Philadelphia, Pa., are the architects.

Baltimore

BALTIMORE, MD., Sept. 13, 1915.

The capital stock of the McNeill Ornamental Iron & Construction Company, Barney and Light streets, Baltimore, has been increased from $1,000 to $25,000. The charter has been amended to include the manufacture of munitions of war and the manufacture and repair of machinery.

The Baltimore & Ohio Railroad Company has offered a tract of 300 acres at Bay Ridge, Md., to the E. I. DuPont de Nemours Powder Company, Wilmington, Del., as a site for a branch plant.

Plans are being considered for enlarging the warehouse of the Carnegie Steel Company, Bush and Wicomico streets, Baltimore. H. D. Bush, local manager, expects some of the officials from Pittsburgh this week to take up the plans.

An additional story will be added to the plant of the Tin Decorating Company, Boston Street and Linwood Avenue, Baltimore. The contract has been awarded the West Construction Company, Knickerbocker Building, and is necessary because of the increase in the company's business. The story will be 42 x 72 ft., and will cost about $5,400.

A two-story acid plant, 75 x 210 ft., will be constructed by the Baugh Chemical Company, Clinton and Eleventh streets, Canton, Md., after plans being prepared by Peter S. Gilchrist, architect, Charlotte, N. C. It will cost about $40,000.

The Auto Outing Company, 21 East North Avenue, Baltimore, have filed plans for the construction of a one-story addition, 41 x 57 ft., to cost about $9,000.

The George A. Boyden Pump Company, Baltimore, is to be incorporated with $1,800,000 capital stock and will construct a plant. It also plans to have branches in Kansas City and San Francisco. The officers are George A. Boyden, president; J. Calvin Boyden, vice-president; Janon Fisher, chairman of the executive committee; Harry Carter Irwin, secretary, and George A. Boyden, Jr., mechanical engineer and superintendent. William L. Marbury and Edwin H. Brownley are counsel. It has opened offices in the Maryland Casualty Company, Baltimore.

Some large contracts probably will be closed this week by the Baltimore Drydocks & Shipbuilding Company, Baltimore. Holden A. Evans is vice-president and general manager.

Work has been started on the new marine shop being erected for the Maryland Steel Company at Sparrows Point, Md.

J. P. Karn, Brunswick, Md., will install wood-working machinery in a factory.

R. S. Brewbaker, Springs, Va., is in the market for a 2-hp. gasoline engine, a small lathe and other equipment for an automobile repair shop.

The grain elevator of the Chesapeake & Ohio Railway at Newport News, Va., which was burned recently with a loss of $2,000,000, is to be rebuilt, according to announcement of the company at its general offices, Richmond, Va. F. I. Cabell is chief engineer.

The Castlewood Mills, Castlewood, Va., will erect a flour milling plant with a capacity of 100 bbl. per day. Power and special machinery will be purchased. The equipment will include a 100-hp. boiler and 80-hp. engine.

The State Lime Board, Staunton, Va., is planning the expenditure of $30,000 in the construction of a large lime-grinding plant in Eastern Virginia.

James C. Smith & Co., 1901 East Cary Street, Richmond, Va., are in the market for shears for cutting heavy wagon tires and similar materials.

The James River Marl Fertilizer Company, Norfolk, Va., has been incorporated with $150,000 capital stock. L. C. W. Page is president and W. S. Weber is secretary.

It is said the Semple-Pennill Company, Petersburg, Va., will shortly install machinery for the manufacture of screens, curtains and paint.

A night force has been started at work at the Riverside, Del., plant of the Bethlehem Steel Company.

Chicago

CHICAGO, ILL., Sept. 13, 1915.

A temporary lull last week in inquiry of that sort which has been directly associated with war orders seems to have been traceable to the pendency of financial arrangements. The present week opens up with a renewal of interest. The buying of machinery for domestic uses is distinctly better and local machinery houses have been making a good aggregate of sales. The large number of plant extensions being undertaken for which new equipment is required is worthy of comment. The Illinois Central Railroad has just closed for a small list of tools and the Chicago Great Western has bought a few machines. Machinery stocks on the floors of dealers remain very ragged but considerable success is had in meeting demand through the picking up of used machinery, of which there seems to be an unfailing supply.

The Edwin T. Perkins Engineering Company, Chicago, advises that the total cost of the work it is supervising for Lee County, Iowa, is to be $400,000 and that the pumping plant to be installed is estimated to cost $47,000.

The Chicago Brass Products Company has been organized with a capital of $20,000 by Carl H. Stein, C. E. Rohenkohl and Harry V. Crooks, 111 West Monroe Street.

The H. Root Foundry Company, Chicago, is building a one-story addition.

The National Carburetor Company, Chicago, has been incorporated with a capital of $5,000 by William A. Edward, Charles G. Lamb, William H. Williams and Edward P. Habel, 5418 West Jackson Boulevard.

The Burlington Aerated Separator Company, Burlington, Iowa, incorporated with a capital of $20,000, has made arrangements to occupy factory space which will be equipped for the manufacture of separating machinery. George L. Wheeler is president and general manager.

The foundry of the Kelly Mfg. Company, Waterloo, Iowa, has been totally destroyed by fire, entailing a loss estimated at $100,000. The ruins offer practically no salvage either in buildings or equipment.

The Martin Metal Company, Wichita, Kan., will build an addition to its plant.

Hankinson, N. D., is taking bids on a system of waterworks for fire protection, for which $10,000 is available.

Indianapolis

INDIANAPOLIS, IND., Sept. 13, 1915.

The DeKalb Mfg. Company has been formed by the law firm of Vesey & Vesey, Fort Wayne, Ind., and will take over the property of W. H. McIntyre, automobile manufacturer, Auburn, who recently filed a petition in bankruptcy. The new company has been incorporated for $150,000.

The H. Clauss Shear Company, Tipton, Ind., will erect a four-story factory, 32 x 216 ft.

The Indiana Coke & Gas Company, recently organized by Alfred F. Ogle, Terre Haute, Ind., is making plans for the erection of a plant to cost $750,000.

The National Motor Car Company, Indianapolis, Ind., will build a factory at Yandes and Twenty-second streets, to cost $30,000.

The Shoals Utilities Company, Shoals, Ind., has been incorporated with $18,000 capital stock, to supply water, light, etc. The directors are Frank M. Baker, S. E. Shirley and G. A. Harrod.

The foundry of the Western Gas Construction Company, Fort Wayne, Ind., suffered a loss of $25,000 by fire. All the patterns were destroyed.

Detroit

DETROIT, MICH., Sept. 13, 1915.

Local demand for tools continues strong and the orders placed indicate activity in widely scattered lines. Good business conditions in the up-state manufacturing centers is reported by traveling salesmen. Inquiry is fair to brisk, with standard tools in metal-working trades in the best demand. Some activity is evident, also, in electrical equipment. New construction work is of minor importance, although a number of good-sized projects are reported as being "in the air."

La Measure Brothers, Detroit, manufacturers of laundry machinery and operators of a laundering plant, have purchased the factory, former Paige Motor Car plant, and will remodel it for their own use. The investment will approximate $100,000.

The Detroit Forging Company, Detroit, has awarded contract for the erection of a one-story brick addition to its plant.

The Armstrong Specialty Company, Detroit, has been incorporated with $25,000 capital stock to manufacture specialties. Philip H. Sheridan, Kendrick M. Bom and William P. Armstrong are the incorporators.

The John Larsen Company, Detroit, manufacturer, has begun the erection of a two-story factory at Monroe and Hastings streets.

The Republic Motor Truck Company, Alma, Mich., has broken ground for an addition to its factory, to cost $20,000. It will add 35,000 sq. ft. to the plant. The company has two other additions under construction.

G. W. Akers and L. S. Kent are at the head of the new Central Michigan Clay Products Company, which proposes to manufacture brick, hollow tile, etc., and will be capitalized at $100,000.

The Benton Harbor Brass & Iron Company, Benton Harbor, Mich., has been incorporated with $15,000 capital stock to manufacture iron and brass castings and specialties. W. H. Lutes and C. H. Kellerman are managing the new company.

The Fuller & Sons Mfg. Company, Kalamazoo, Mich., manufacturer of clutches and transmission gears, will erect a four-story addition to its plant, 61 x 100 ft., of factory construction. It will install gear cutting and special equipment and will add to its payroll.

The D'Arcy Spring Company, Kalamazoo, Mich., manufacturer of automobile and bed springs, will erect an addition to its plant. It has purchased the wire-working equipment of the defunct Independent Steel & Wire Company, Nenova, W. Va.

The W. H. Chase Furniture Company, Grand Rapids, Mich., has been incorporated with $15,000 capital stock to manufacture furniture. W. H. Chase is the principal stockholder.

The Auto Body Company, Lansing, Mich., will build at once a three-story shop, 66 x 105 ft., which, together with the power plant now under construction, will cost about $75,000.

Nelson Brothers, Saginaw, Mich., manufacturers of gasoline engines and pumping machinery, are building an addition to their plant, to cost about $30,000.

The Flint Varnish Works, Flint, Mich., will build four factory buildings, to double the capacity of its plant.

The Piston Ring Company, Muskegon Heights, Mich., will build an addition to its plant.

The American Welding Company, Detroit, Mich., has been organized with a capital stock of $2,500 by M. E., T. E., C. E. Turrell and G. B. Woolton.

The Fox Machine Company, Grand Rapids, Mich., has completed arrangements for the removal of its plant to Jackson, Mich., where a program of expansion is contemplated.

Raymond F. Smith, 210 Lyon Street, Grand Rapids, Mich., who with others is organizing a company for the fabrication of structural steel, advises that they will soon be in the market for punches, drill presses, cold saws and pneumatic machinery, together with the electrical equipment for motor drives throughout.

The Adolph Leitelt Iron Works, Grand Rapids, Mich., recently renewed its charter with a capital of $500,000, to continue business. It has been in existence thirty years.

Milwaukee

MILWAUKEE, WIS., Sept. 13, 1915.

Improvement in the metal-working trades is rapid, but there is no evidence of an inflated boom and the betterment is sound. It is becoming more evident that so-called war orders are but a small part of the business that is being done. Domestic demand for machine tools continues at a rate hardly ever paralleled, and full time and perhaps overtime operations are assured well into next year. Builders of heavy machinery find a brisk inquiry, and a revival of business in prime movers, which have been dormant for a year and a half, is now indicated. Taken as a whole, the metalworking trades have increased their productive capacity from a scant 45 per cent to an average of 75 or 80 per cent in four months' time.

The John G. Wolleager Company, manufacturer of automobiles, 417-421 Wells Street, Milwaukee, will build a concrete and brick addition, 60 x 90 ft., two stories, to be used mainly for repairs and service station.

Ferdinand Larson is building an automobile repair shop at Bear Creek, Wis.

The city of Milwaukee will establish a central machine and repair shop, if a proposition now before the Common Council is adopted. The department of public works is making a survey of all machine shop and repair work done by and for the city to determine the size and equipment required for the proposed shop. Fred G. Simmons is commissioner of public works.

The John Schroeder Lumber Company, Milwaukee, Wis., will erect a factory, 50 x 60 ft., two stories, of brick and mill construction, to be equipped with mill working machinery.

The construction of the additions to the plant of the American Car & Foundry Company at Madison, Wis., is well under way and it is understood the company is now in the market for further equipment.

Fire destroyed the flouring mill and electric light plant at Mondovi, Wis., entailing a loss of $30,000.

The Wisconsin Bridge & Iron Company, Milwaukee, Wis., is having plans prepared for a foundry, 80 x 270 ft.

The Lloyd Mfg. Company, Menominee, Wis., has plans for enlarging its plant and has announced that a new boiler and special machinery of its own design are to be installed.

The International Wire Works, Menasha, Wis., has been organized with a capital of $25,000, by J. M. Graef, to manufacture special wire for paper mill use. The company is in possession of wire-making machines of new design, which are largely responsible for the enterprise.

The Waukesha Motor Company, Waukesha, Wis., which had practically doubled its capacity last winter and spring, is again extending its works. The new demand is for engines for agricultural machinery, notably tractors. It will remodel its present building into a machine shop.

The Hofstedt Saw & Machine Company, Neenah, Wis., has been organized by Edwin Hofstedt and has established a shop at River and Tayco streets for the manufacture, repair and fitting of saws, and the welding of steel, copper, brass, aluminum and other metals by the oxy-acetylene process.

The Geuder, Paeschke & Frey Company, Milwaukee, maker of pieced and stamped ware, etc., which recently purchased the plant of the National Blower Works, will not embark in the manufacture of heating and ventilating apparatus but will simply use the additional space in providing greater facilities for the production of its own specialties.

Cincinnati

CINCINNATI, OHIO, Sept. 13, 1915.

It is generally known that additional orders for shells have been placed in the Miami Valley, but denials can be made that any firm in Cincinnati is engaged in the manufacture of war munitions. Local business men are, however, interested in the reported experiences of manufacturers located in a more central portion of the State, who have taken on numerous contracts. A great deal of difficulty was experienced in filling shrapnel contracts, and it is only recently that these firms have been able to meet the specifications required and operate their plants at a profit. Late contracts include orders for British 4.5-in. high-explosive shells, which are said to be easier to manufacture, according to the requirements imposed by the purchaser.

The local machine-tool situation is unchanged, and while considerable business is offered manufacturers are not anxious to make contracts very far ahead. Although the railroads have not put out any lists lately, it is known, on good authority, that they will buy many machine tools next year, provided deliveries and satisfactory prices can be obtained.

The boiler and tank situation continues to improve, and small electric drilling and grinding machines are also in better demand. Wood-working equipment is quite dull, although the inquiry from the South is slowly improving.

The Citizens Artificial Ice Company, Cincinnati, recently incorporated, will erect an ice plant of 50 tons daily capacity on Jefferson Street, at an estimated cost of $45,000.

Glendale, Ohio, a Cincinnati suburb, will add to its waterworks plant equipment.

The Indianapolis division of the Big Four Railway Company, D. J. Mullen, superintendent of motive power, Indianapolis, Ind., is inquiring in this market for a locomotive cylinder boring mill.

Bids will be opened Oct. 1 for heating equipment to be installed in the Ohio National Guard Armory, Cincinnati. Fred E. Wesselmann is president of the board of county commissioners.

The Craig Mfg. Company, manufacturer of metal furniture, Washington Courthouse, Ohio, is making an addition to its plant on South Main Street.

The Union Station Transfer Company, Dayton, Ohio, has awarded contract to Adam Schantz, Dayton, for a two-story garage and repair shop to be erected on Court Street.

The Manufacturers' Production Company, Dayton, Ohio, has been incorporated to manufacture shells and other war munitions. The plant of the New Era Gas Engine Company has been leased and is now being fitted up with extra equipment. Details as to the number of machine tools needed are not now available.

The plant of the Gondert & Lienesch Lumber Company, Dayton, Ohio, which recently suffered a fire loss estimated at $25,000, will be rebuilt.

The daily press announces that the plant of the Mechlin Bent Woodworks Company will be re-established at Winchester, Ohio. Its present plant is near Mobile, Ala., to which point it was removed from Winchester some time ago.

It is reported that the Pittsburgh Boiler & Tank Company, Pittsburgh, Pa., has acquired an interest in the Carroll-Porter Boiler Works Company, Wellsville, Ohio, and will increase the capacity of that plant.

The East Sparta Milling Company, East Sparta, Ohio, has been incorporated with $25,000 capital stock by J. J. Conrad, D. S. Sommer, and others.

Cleveland

CLEVELAND, OHIO, Sept. 13, 1915.

Several new inquiries for round lots of lathes for machining forged shells have come out from manufacturing plants in this territory, as well as an active demand for machine tools for plant extensions. Some of these extensions are for making products in no way associated with war orders. The automobile industry continues to buy a lot of equipment and jobbing machine shops which are crowded with work are adding machinery. Sales during the week were in small lots, lathe orders predominating. Some of the local dealers are able to make good deliveries on lathes, owing to placing large stock orders before the heavy demand was under way. Another Ohio company has entered the lathe-making field with a single-purpose machine. The domestic demand for turret lathes is still heavy. Several machines have been purchased by the War Department for the Franklin and Rockford Arsenals. Conditions in the steel-making industry are reflected in a good volume of orders for cranes and other equipment for steel plants. The domestic demand for locomotive cranes is good, but little foreign business is coming out since the placing of large orders by France and Russia. All the cranes in the Russian order for 38 machines have been shipped and some of those bought by France in a 42-lot order are now going forward.

The Machine Products Company, Cleveland, has been incorporated with a capital stock of $25,000 by Frank Horsburgh of the Horsburgh & Scott Company, E. H. Browning and J. R. Browning of the Browning Company, and others, to manufacture a new machine for planing beveled gears. The company has established a plant on Syracuse and Berlin streets.

The Weideman Company, Cleveland, manufacturing grocer and maker of bakers' confectionery and ice cream machinery, will build a seven-story addition to its plant, 88 x 90 ft., of steel and concrete. A heating and power plant will be installed to take care of the new building and old plant. Various other equipment will be required.

The White Company, Cleveland, has taken an order from Russia for 300 automobile tank trucks for supplying automobiles with gasoline and oil. The tanks have two compartments, one with a capacity of 12,000 gal. for gasoline and the other 300 gal. for oil.

Bids will be received shortly for an administration building to be erected by the White Sewing M[illegible] Company, Cleveland. George H. Smith is the archite[illegible]

It is reported that the Cleveland Axle Mfg. Company, Canton, Ohio, will install a drop forging [illegible] for which equipment has been purchased. No additional buildings are planned for the present.

The Bonnot Company, Canton, Ohio, will shortly begin the erection of a new plant extension previously mentioned. This will be one story of brick and steel, 40 x 160 ft., to be used as a machine shop.

The Marion Tire & Rubber Company, Marion, Ohio, has been incorporated with a capital stock of $200,000 and will establish a plant for the manufacture of rubber tires. It has leased a building.

The Gramm-Bernstein Company, Lima, Ohio, maker of motor trucks, which has just completed a number of plant extensions, will erect an additional building, 100 x 200 ft.

Through the efforts of the chamber of commerce, Salem, Ohio, funds have been provided for securing the plant of the Porter Rubber Company for that city and it is expected that construction work will be started shortly. It will be a one-story building, 60 x 300 ft.

Sealed bids will be received Oct. 1 by the board of trustees of the Wilberforce University, Wilberforce, Ohio, for extensions to the water supply system at Wilberforce University, which will include an 80,000-gal. steel tank and tower, two steam pumps, a hot water storage heater, and a water-softening plant. The Richards Engineering Company, Wilberforce, Ohio, is the consulting engineer.

The B. F. Goodrich Company, Akron, Ohio, is planning the erection of a large factory, in addition to the new building now under construction.

The Extension Display Specialties Company, New Philadelphia, Ohio, has been incorporated with a capital stock of $12,500 by C. W. Matthias, J. E. Hurst, and others, to manufacture sample cases and various specialties. It has established a plant in the Miller-Brown Building in that city.

The Central South

LOUISVILLE, KY., Sept. 13, 1915.

Better business is indicated by the fact that machinery manufacturers who have been buying little or no new equipment the past year, are now undertaking various improvements. The demand for steam power equipment is excellent, but complaint continues that profitless prices are still quoted, especially on boilers. Boilermakers report that they are figuring on a lot of work, but that much of it is going at such low prices that no money can possibly be made on the business. The demand for electrical equipment is less active. Machine tools are in good demand, as heretofore, and there are also numerous openings for the sale of wood-working equipment.

The Henry Vogt Machine Company, Louisville, is in the market for a 1000-ton hydraulic press, of four-column design. It placed an order this week with the Nordberg Mfg. Company, Milwaukee, for an air compressor with a capacity of 1500 cu. ft. per min.

L. D. Baer, Owensboro, Ky., will be in the market shortly for equipment for an automobile garage and repair shop.

The Fenton Dry Cleaning Company, Lexington, Ky., will build a plant. Power and special equipment will be needed. S. G. Fenton is manager.

The Perry County Block Coal Company, Hazard, Ky., which has been developing a large tract of coal lands, will resume the purchase of equipment shortly. R. F. Peters is buyer.

The Carlisle Electric Light & Power Company, Carlisle, Ky., is in the market for a 20-ton ice machine. Delivery by April 1 is specified.

The Ashland Leather Company, Ashland, Ky., is planning the erection of a plant at Glenray, W. Va., for the manufacture of dyes and tanning extracts.

The Perry Light & Ice Company, Clay, Ky., is in the market for a second-hand 60-cycle, 2200-volt, single-phase, 50 to 75-kw. alternating current generator with exciter, and a second-hand 50 to 100-hp. steam engine.

S. L. Dodds, Hickman, Ky., is reported in the market for additional equipment for a cotton gin.

The John G. Duncan Company, Knoxville, Tenn., is in the market for a second-hand 150-hp. Corliss engine.

The J. R. Sutherland Construction Company, Kansas City, Mo., has the contract for the construction of the waterworks system at Maryville, Tenn., to cost $51,000.

The Reynolds Corporation, Bristol, Tenn., is considering adding motor-driven equipment for the manufacture of scouring powder.

The Robinson Balance Slide Valve Company, Knoxville, Tenn., has been incorporated with $150,000 capital stock by W. J. Savage, J. G. Crumbliss and Frank P. Robinson.

The Pacific Northwest

SEATTLE, WASH., Sept. 7, 1915.

A gradual increase of activity is noted in the machinery trade, though the movement of metal-working equipment is greatly hampered by lack of stock. Even desirable second-hand tools are not very plentiful. While most buyers prefer to wait rather than pay present prices, the few who expect their needs to be at all urgent are getting into the market. Local manufacturers are beginning to derive some benefit from the congestion in other quarters. The implement trade is keeping up remarkably well, and considerable flour and feed-mill machinery is being sold. In lumber machinery a large repair business is being done and a better demand is found for new equipment than for some time. Mining and smelting development continues active, principally in copper, though some progress is being made toward developing minerals hitherto neglected.

The plant of the Eccles Lumber Company, Baker, Ore., was destroyed by fire Sept. 4, with a loss approximating $100,000.

The Valveless Engine Corporation, Seattle, Wash., has been organized by R. A. Bloom, H. E. Johnson and G. T. Mogan, with a capital stock of $100,000.

The Port Townsend & Puget Sound Railroad has started work on a ferry depot and warehouse at Port Townsend, Wash., and it is reported that the buildings will include a roundhouse and machine shop.

It is reported that G. W. Kunze will build an electrically operated sawmill of about 100,000 ft. daily capacity at Arlington, Wash., together with electric generating capacity to furnish the town with light.

The plant of the Northwestern Iron Company, 1041 Railroad Avenue South, Seattle, was completely destroyed in a recent fire. The plants of the Washington Welding & Machinery Company and the Alaska Copper Company, in the same block, were also heavily damaged.

The Jensen Shingle Mill, Wheeler, Ore., has been leased by F. B. Sturgis, formerly of Raymond, Wash., who will make some improvements and put it in operation at once, with a capacity of 90,000 shingles per day.

The Rolfe Milling Company, Baker Mont., will erect a flouring mill with a capacity of 150 bbl. daily. L. R. Rolfe is president.

The plant of the Portland Sash & Door Company, Portland, Ore., was burned recently with a loss of over $20,000. The plant of the Oregon Builders Supply Company was completely destroyed in the same fire, with a loss of more than $5,000, and the plant of the Phoenix Iron Works was damaged to the extent of $1,000.

The Empire Construction Company, Great Falls, Mont., has been incorporated by Fred J. Brunckhort, I. W. Richardson and C. F. Holt, all at Great Falls, with a capital stock of $40,000 to deal in mill and elevator machinery, etc.

The Beaver Portland Cement Company, Portland, Ore., now building a plant at Gold Hill, has ordered construction work to proceed at once. The plant will cost $600,000, and was started before the European war commenced, work having been suspended since that time.

C. C. Bullis, Medford, Ore., manager of the Southern Traction Company, plans to acquire the plant of the Trail Lumber Company and will run a box factory in connection with it.

The Pacific Electric Welding & Mfg. Company, Arcade Building, Seattle, will establish a plant in Renton, Wash., for the manufacture of electric welding machines, and will also manufacture novelties, sheet metal and ornamental iron. Hugh Thornblade is president.

Contract for construction of a 40,000-bu. grain elevator to be built in Cut Bank, Mont., by Larson & Bonboy, has been awarded to the Lange Engineering & Construction Company, Great Falls, Mont.

Coulee City, Wash., has granted to Oscar Ellefson a franchise for an electric light and power plant and distribution system to supply the city with light and power. It is understood construction will start immediately.

City Council of Kendrick, Idaho, has granted electric light franchise to A. V. Dunkle, Plummer, Idaho, who agrees to construct a plant ready for operation within sixty days. The work involves an expenditure of $10,000.

The Western Auto Company, Seattle, has been incorporated for $1,000,000 by C. A. Cawley and George L. Grant and others, and will immediately establish an assembling plant in the former Gorham factory on Lane Street. Work at the plant will begin within sixty days and will employ seventy-five men.

F. S. Harmon & Co., furniture manufacturers, Tacoma, has taken over the plant and buildings of the West End Mfg. Company in that city, and will immediately convert it into a chair factory. J. S. Kean is manager.

D. E. Nebergall & Co., Albany, Ore., plan the erection of a packing plant to cost about $15,000.

The water board, Eugene, Ore., plans the construction of an auxiliary electric plant of 1250 kw. capacity operated by steam, to cost $50,000.

Four manufacturing companies in Bellingham, Wash., the Byrne-Turner Company, the Morse Hardware Company, Reid Brothers, and the Whatcom Machinery Depot, have allied their interests for the manufacture of cyanide plants, smelters, tube mills and other ore reduction machinery. Some patterns for mining machinery are already on hand, and the companies plan the purchase of a large quantity of additional equipment. Cyanide tanks, pipes and other wood work will be manufactured by the Byrne-Turner Company; the Morse Hardware Company will manufacture small supplies; the Whatcom Machinery Depot will manufacture mill machinery and Reid Brothers will make boilers and steel tanks. Sales agencies will be established in various cities. W. A. Burr, mining engineer, is department manager.

Texas

AUSTIN, TEX., Sept 11, 1915.

The machinery and tool trade shows some improvement, due to the marketing of cotton and other fall crops. Extensive building operations, in which the erection of new manufacturing plants will figure largely, are promised for the next several months. A feeling of optimism prevails in general business and industrial circles.

The Standard Oil Company of Oklahoma, Tampico, Mexico, recently organized with a capital stock of $5,000,000, has secured extensive oil land leases in the Gulf coast region of Mexico and will conduct oil development operations as soon as peace is restored there. Charles Haskell, Guthrie, Okla., is president.

Charles F. Z. Caracristi, Washington, D. C., consulting engineer for the International Boundary Commission of Mexico and the United States, has prepared plans for a proposed dam to be built across the Rio Grande River in Lajitas Canyon, about 100 miles south of Alpine. The estimated cost of the proposed structure is $6,000,000. While the main purpose of the dam will be to control the flood waters of the Rio Grande it will also provide the initial energy for generating 48,000 hp. of electricity, as the construction of a large hydroelectric plant in connection with the project is embraced in the plans. The last session of Congress made an appropriation of $50,000 for preliminary surveys and estimates of the proposed works. To put the project into effect a joint treaty between the United States and Mexico will be necessary.

The carpenter shop of the Chicago, Rock Island & Gulf Railroad at Fort Worth, recently destroyed by fire, will be rebuilt.

The Nashco Silo Company, Waco, has been organized with a capital stock of $20,000 to manufacture silos. Charles E. Moore is a stockholder.

The Pharr Mill & Elevator Company, Pharr, has been organized with a capital stock of $50,000 to build a mill and elevator. George E. Thomas is one of the promoters.

Edward Kennedy, Houston, and associates, who were promoting the construction of an interurban electric railway between Houston and Richmond, a distance of about 30 miles, have amended their plans so as to make San Antonio the western terminus. The proposed line will be about 225 miles long. The Houston, Richmond & San Antonio Interurban Railway Company will be organized with a capital stock of $250,000. The building of electric power stations is embraced in the plans.

Clarence Webb and J. W. Clements, Temple, will build a garage and repair shop to cost about $20,000.

The Southwestern Power, Light & Railway Company has been organized with a capital stock of $12,000,000 to construct an interurban electric railway between Denison, Tex., and Oklahoma City. It plans to build a group of hydroelectric plants in southwestern Oklahoma and provide power for towns and industrial plants. It also purposes to construct municipal waterworks plants in the towns that are to be embraced in its power system. W. T. Croslin of Denison is president.

The Northwestern Portland Cement Company, El Paso, Tex., will erect a cement plant at Victorville, Cal., at an estimated cost of $500,000. Carl Leonardt is president.

The American Smelting & Refining Company is erecting two converters at El Paso, Tex., to replace three now in use. Two electric traveling cranes are specified.

Canada

TORONTO, Sept. 13, 1915.

The Canadian Car & Foundry Company, Montreal, it is announced, is about to close a contract with the Russian Government for the manufacture of 3,000,000 shrapnel and explosive shells. The value of the contract is placed at approximately $52,000,000. The negotiations which have been carried on by cable are about to be concluded and the papers will be signed in a few days.

The Raven Roy Shingle Mfg. Company, Ltd., Hatzic, B. C., has been incorporated with a capital stock of $10,000 to manufacture lumber and shingles.

T. R. Barting, town engineer, Liverpool, N. S., has been authorized to prepare plans and call for bids for improvements to the electric light plant to cost $15,000.

The Metagami Pulp & Paper Company, Cochrane, Ont., will commence work shortly on the construction of a pulp and paper mill on the Metagami River, 30 miles from Cochrane.

The Carter-Halls-Addinger Company, Winnipeg, has received the contract for the erection of an assembling plant at Winnipeg, for the Ford Motor Company, to cost $200,000.

The Canadian Oil Company, 12 Strachan Avenue, Toronto, will build a factory 40 x 60 ft. and four large storage tanks at Portage la Prairie, Man.

The Algoma Steel Corporation, Sault Ste. Marie, Ont., is contemplating extensive alterations and extensions to its plant, including the installation of a new open-hearth furnace.

The King Separator Company, Buffalo, N. Y., will erect a plant at Bridgeburg, Ont., for assembling parts of its Canadian product.

Work on the construction of a new pumping station for St. Andrew's will be commenced at once. The new station and improvements to the system will cost $35,000.

The Everyman's Car Company, Ltd., Ottawa, has been incorporated with a capital stock of $40,000 by Arthur M. Jaques, James W. Nicoll, Charles A. Jaques, Montreal, Que., and others, to manufacture automobiles, motor trucks, motors, engines, etc.

The British American Chemical Company, Ltd., Montreal, has been incorporated with a capital stock of $50,000 by Errol Languedoc, Ralph E. Allan, Ernest Copeland, and others, to manufacture chemicals.

The Newmarket Metal Toy Mfg. Company, Ltd., Newmarket, Ont., has been incorporated with a capital stock of $40,000 by Aubrey Davis, Peter W. Peterson, Harold E. Choppin, and others, to manufacture metal, tin, toys, etc.

The Pullman Motors, Ltd., Toronto, Ont., has been incorporated with a capital stock of $100,000 by David Pullman, John E. Webb, 9 Fisher Street; John T. Webb, 81 Colborne Street, and others, to manufacture automobiles, motors, auto trucks, etc.

The Thompson-James Company, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Cecil H. Thompson, care of the Martin Pump & Machine Company, Ltd., 43 Davies Avenue; James R. L. Starr, 436 Markham Street; Arthur S. James, and others, to manufacture explosives, shells, cartridges, brass, copper, zinc, iron and other metals, etc.

The Associated Cement Company, Ltd., Bamberton, B. C., will install a new electric shovel at its plant.

The Imperial Oil Company, Montreal, is contemplating the erection of an asphalt and fuel oil refinery at Halifax, N. S., to cost $400,000.

Mark's Carriage Factory, Moncton, N. B., was destroyed by fire with a loss of $25,000.

A new pumping station, disposal plant and treatment plant for sewage will be built at the foot of Superior Avenue, Mimico, Ont., by the Town Council.

The Canadian Salt Company, Windsor, Ont., is doubling the capacity of its plant there for the manufacture of caustic powder and bleaching powder.

The following factories were destroyed by fire at Kenora, Ont. The Scott & Hudson planing factory, which lost in stock and machinery $35,000, and Graham's blacksmith shop, which lost $2,000.

Brigden, Ont., is contemplating the installation of a new engine, dynamos, and other equipment to increase the capacity of its electric light plant.

Stratford, Ont., is contemplating the installation of a new standpipe and an auxiliary gasoline pumping station to cost $50,000. E. K. Barnsdale is mayor.

The Superior Tubes & Accessories, Ltd., Toronto, recently incorporated with a capital stock of $300,000, will build a plant for the manufacture of automobiles, iron, brass, machinery, etc. Among those interested in the company are Clifford G. Lynch, Room 1201 C. P. R. Building; J. B. Taylor, 78 Belhaven Avenue, Toronto, and others.

The Hydroelectric Commission, Toronto, will build six transformer stations at Guelph, Preston, Berlin, St. Mary's, Woodstock, and Cooksville, Ont., each 36 x 60 ft., of metal construction throughout.

The Copeland Chatterson Company, Brampton, Ont., will build an addition to its factory. Hill & McCullock are the contractors.

The Hydroelectric Commission, St. Thomas, Ont., will erect a powerhouse and transmission station.

The Wortman & Ward Company, London, Ont., manufacturer of iron force and lift pumps, etc., will commence the erection of an addition to its plant to cost $20,000.

The City Council, Moose Jaw, Sask., will purchase a new electrically driven sewage pump with a capacity of 700 gal. per min.

The Zinc Company, Ltd., Sherbrooke, Que., has been incorporated with a capital stock of $100,000 by Charles H. Maxey, Rutherford, N. J.; Leland D. Adams, Oakland, Cal.; Charles W. Cate, Sherbrooke, and others, to manufacture and refine zinc, etc.

The Capital Electric Company, Ltd., Ottawa, has been incorporated with a capital stock of $40,000 by Robert P. Moodie, Edward T. Headley, James H. Gervan, and others, to manufacture electrical apparatus, brass, etc.

The Schaake Company, New Westminster, B. C., will install a machine shop in the former Schaake Machine Works factory. The shops will manufacture machinery for shingle mills, sawmills and canneries, and will also have a capacity of 100 18-lb. high explosive shells a day. Henry Schaake is president.

Government Purchases

WASHINGTON, D. C., Sept. 13, 1915.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Sept. 28, schedule 8709, steam engineering, class 1, for one circulating pump and spare parts for Mare Island and also for f.o.b. works; until Oct. 5, schedule 8780, for two 18-in. x 8-ft. geared head lathes, one 16-in. x 6-ft. geared head lathe, one 12-ft. boring and turning mill and one trimming press, all for Washington, D. C.; schedule 8781, one 2½ x 26 turntable lathe, for Boston; schedule 8782, two 21-in. upright drills, two 12-in. double emery grinders, two screw-cutting engine lathes and two 16-in. crank shaping machines, all for Boston and Philadelphia; until Oct. 12, schedule 8767, one 20-ton electric traveling crane, and one foundry crane for Olongapo, New York, or f.o.b. works; schedule 8766, two electrically driven pumps for Puget Sound; until Oct. 5, schedule 8788, 100 test pumps for Newport; until Oct. 12, schedule 8787, nine double purchase winches for Brooklyn; schedule 8804, two auxiliary condensers, two single-acting air pumps, four fuel oil pumps and miscellaneous feed pumps, fire pumps, valves, etc.

The Superintendent of the State, War and Navy Building, Washington, D. C., will receive sealed proposals until 2 p. m. Sept. 18, for an electrically operated hoist to replace present engine operating ash-handling equipment.

Bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, Sept. 7, for five cutting torches, six circular torches and 12 valves under schedule 8700, construction and repair, class 171, for Brooklyn—Burdett Mfg. Company, $189, part; Otto Bernz, $430, part; Davis-Bournonville Company, $2,560; K. G. Welding & Cutting Company, $740; Oxweld Acetylene Company, $1,296; Prest-O-Lite Company, $670, part; schedule 8688, class 101, Washington, for one planing machine—Gleason Works, $2,200.

Bids were received by the commanding officer, Frankford Arsenal, Philadelphia, Aug. 31, under proposal 46, for one trimming and beading machine as follows: D. Nast Machinery Company, $224 each; E. W. Bliss Company, $225 each; and on Sept. 1, proposal No. 42, for two hand turret machines of Warner & Swasey, No. 2A type, or equal; Manning, Maxwell & Moore, $1,390 each.

Wisconsin expended $382,352 for industrial and commercial education in the school year ended June 30, 1915. The report of Warren E. Hicks, supervisor of industrial education, states that there are now eighty-five industrial, commercial, continuation and evening schools in the State, classified as follows: Industrial, 23; commercial, 7; continuation, 27; evening, 28. The total attendance was 28,214. The Milwaukee continuation schools, naturally the largest, had a total attendance of 10,908, and the cost was $148,509.77.